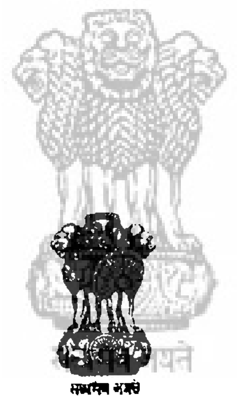
REPORT

OF

THE MINE SAFETY EQUIPMENT COMMITTEE



MINISTRY OF LABOUR AND EMPLOYMENT
GOVERNMENT OF INDIA
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CONTENTS

Summary of Observations and Recommendations .. .. 1—12

PARAGRAPHS

I. INTRODUCTORY 1—4
Background 1
Appointment of Committee 2
Terms of Reference 3
Work of the Committee 4

II. GENERAL CONSIDERATIONS 5—11
Capital Equipment' and 'Consumable Material' 7
Spares 8
Assessment made by Coal Council .. .. 9—10
Approximate Price and Life of Safety Equipment 11

III. REQUIREMENTS OF COAL MINES 12—16
Explanatory Notes 13
Assumptions .. .. 14—15
Total Annual Requirements 16

IV. REQUIREMENTS OF METALLIFEROUS MINES 17—19
Assumptions 18
Requirements 19

V. INDIGENOUS MANUFACTURE 20—36
'Permitted' Explosives etc. 22
Flame-proof Equipment 23
Winding Equipment 24
    Chains .. .. 24·2
    Annealing Facilities .. .. 24·3
Telephones etc. 25
Haulage Equipment 26
Wire Ropes 27
Mine Support 28
Pumps etc. 29
Lighting Equipment 30
Ventilating Equipment 31
Fire-resistant Brattice Cloth etc. .. .. 31·2
Equipment for Dust Control, Fire-fighting and Rescue etc. .. 32
Protective Equipment 33
Medical Equipment 34
Survey Equipment 35

VI. THE PROBLEM OF SPARES 37—40
Most spares to be imported 39
Indigenous Manufacture of Spares 40

सत्यमेव जयते

PARAGRAPHS

VII. IMPORT OF MINE SAFETY EQUIPMENT 41—53

Procedure for importing equipment .. .. 43—45
Delay in issue of Import Licences 46
Import of equipment manufactured indigenously 47
Certifying Authority for Mine Safety Equipment 48
Other difficulties .. .. 49—50
Spare Parts 51
Import Trade Policy 52-53

VIII. MINE SAFETY EQUIPMENT ADVISORY BOARD .. .. 54—56

IX. MISCELLANEOUS 57

No.	Appendices	PAGES
A.	List of Safety Equipment and Material (Coal Mines) ..	32
B.	List of Safety Equipment and Material (Metalliferous Mines)	34
C.	Sub-Committee (of the Production and Preparation Committee of the Coal Council of India) on the Requirements for mining Machinery and Equipment during the Third Five Year Plan—Composition and terms of reference	36
D.	Assessment made by Coal Council Sub-committee in respect of requirements of underground mining machinery and equipment for a standard unit of one million ton annual production	37
E.	Assessment made by Coal Council Sub-committee in respect of requirements of opencast mining machinery and equipment for a standard unit of 2·5 to 3 million tons annual production.	42
F.	Approximate prices and life of some Safety Equipment and Material	43
G.	Requirements of Mine Safety Equipment and material for a unit of one million ton annual Coal output (underground workings)	45
H.	Requirements of Mine Safety Equipment and material for a unit of one million ton annual coal output (opencast workings)	48
I.	Estimated annual requirements of Coal Mines for Safety Equipment and Material (1961 & 1965) ..	49
J.	Copy of letter dated 17th January 1961 from Director (Mineral) of the Planning Commisssion	54
K.	Requirements of Mine Safety Equipment and Material for a unit producing one million ton of Mineral ore annually from opencast workings	55
L.	Estimated annual requirements of Metalliferous Mines for Safety Equipment and Material (1961 & 1965)..	56
M.	Total Estimated Annual Requirements for Mine Safety Equipment and Material (1961 to 1965) ..	59

PAGES

N-A. List of Items still imported for the manufacture of Electric Safety Lamps 63

N-B. Estimated Production of Spares for Electric Safety Lamps 65

N-C. Quantity of spare parts actually manufactured Annually since start of Plan 66

O-A. Summary of some requirements for fire-proofed Brattice Cloth 68

O-B. A Note on Fire-proofing Jute 70

P. Fire-fighting equipment under manufacture in India --Names of indigenous manufactures.. 71

Q. Extract from Government of India, Ministry of Commerce and Industry Import Trade Control Policy for the Licensing period April-September 1960 (Established Importers) 75

R. Extract from Government of India, Ministry of Commerce and Industry Import Trade Control Policy for Licensing period April-September ·1960 (Actual Users) 78

सत्यमेव जयते

REPORT OF THE COMMITTEE ON MINING INDUSTRY'S REQUIREMENTS FOR SAFETY EQUIPMENT

I. INTRODUCTORY

Background

1. While considering the question of availability of safety equipment in mines, the Conference on Safety in Mines (1958-59) convened by the Government of India recorded that certain equipment and material were vital to the safe working of mines. Some of these, such as fire-resistant brattice, incombustible dust, etc. are of simple nature and easy manufacture, whilst others have to be imported in large quantities because either they are not manufactured within the country or the capacity of indigenous producers is small. Noting that mine operators cannot be expected to observe vital provisions of safety legislation unless the necessary material and equipment are available within the country, the Conference recommended that a Committee may be constituted to consider the whole problem and to recommend measures to meet the same.

Appointment of Committee

2·1. Vide their letter No. MI-27(5)/59, dated the 26th October, 1959 addressed to the Chief Inspector of Mines in India, the Government of India in the Ministry of Labour and Employment set up a Committee with the following composition to assess the mining industry's requirements for safety equipment and to recommend measures to meet the same;

Chairman

1. Chief Inspector of Mines, Dhanbad.

Members

2.	Shri K.S.R. Chari, Deputy Chief Mining Engineer, National Coal Development Corporation, Ranchi.	Representing the Ministry of Steel, Mines & Fuel.
3.	Mr. K. J. Welsh, Supervising Engineer, Messrs. Andrew Yule & Co., Limited, P.O. Dishergarh.	Representing the Coal Mining Industry.
4.	Shri V. M. Sundara Rajan, Superintendent, Nundydrug Mines, Kolar Goldfield, P.O. Oorgaum.	Representing the Metalliferous Mining Industry.

5.	Shri B. H. Engineer, Chief Mining Engineer, M/s. Tata Iron & Steel Co., Limited, P. O. Jealgora.	Representing Mine Managers
6.	Shri R. N. Sharma, Vice-President, Indian National Mine Workers Federation, Opposite State Bank, Dhanbad.	Representing Mine Workers.

Secretary

7. Shri G. S. Marwaha, Regional Inspector of Mines, Special Investigation Duties, Dhanbad.

2·2. Vide their letter No. 21/1/60-M.I, dated the 20th January, 1960, the Government of India appointed the Additional Chief Inspector of Mines as the Chairman of the Committee in place of the Chief Inspector of Mines.

Terms of Reference

3. The following were the terms of reference of the Committee :

(i) "to determine the requirements of mines of safety material and equipment in the immediate as well as foreseeable future;

(*ii*) "to evaluate the production capacity of existing indigenous manufactures;

(*iii*) "to make suggestions for the manufacture of safety material and equipment not produced in the country at present; and

(*iv*) "to assess the requirement of raw material for indigenous production of safety material and equipment."

Work of the Committee

4·1. The Committee held five meetings in all. At the first meeting, the problem of availability of mine safety equipment was discussed in general and a tentative list of mine safety equipment and material was approved. The Secretary was then requested to collect the necessary data from :

(*a*) managements of coal mines,

(*b*) managements of metalliferous mines, and

(*c*) indigenous manufacturers of mining machinery and equipment.

For this purpose suitable questionnaires were sent out. Information regarding requirements of coal mines was asked for from 20 addresses (including the Neyvelli Lignite Corporation) and regarding those of metalliferous mines from 21 addresses (including several associations of mine-owners). While all the addresses in coal mines sent replies, the response from the metalliferous mines was not quite satisfactory.

4·2. Over a hundred letters were issued to various manufacturers enquiring about their capacities for production of mine safety equipment, their expansion programmes and their requirements for raw material. Personal discussions were also held by the Secretary with some of them. Considerable correspondence was also made with the Development Wing of the Government of India, Ministry of Commerce and Industry, in connection with this aspect of the problem.

4·3. The Secretary also held a discussion with the Deputy Chief Controller of Imports and Exports, Calcutta, in connection with the problems attending import of equipment.

4·4. At the second and third meetings, the data obtained as above were studied and discussed. The Secretary was then directed to draft out a report which was considered by the Committee at its fourth meeting. The report was finalised and signed at the fifth meeting of the Committee held on 15 February, 1961.

4·5. Shri V. M. Sundara Rajan, Member, could not attend any meeting of the Committee due to other preoccupations and the long distance to be travelled. This report is therefore not signed by him. However, he kept in constant touch with the work of the Committee and is in full agreement with the Report and with our recommendations.

II. GENERAL CONSIDERATIONS

5. Every mine requires certain machinery and other equipment and material to run it, the type and quantity depending upon a large number of factors including, in the main, size of unit, nature of deposit, depth of workings, degree of mechanisation. All these factors are so diverse and often unpredictable that it is extremely difficult to assess the requirements of mines still to be opened, to any degree of accuracy. All that is possible is to make 'an inspired guess'. (The guess is of course based on a number of assumptions; these are mentioned in the body of the report at appropriate places). It is therefore to be stressed at the very beginning that all assessments

made in this report are to be considered with this background in view.

6. Many times of machinery and equipment used in mining operations are required mainly or solely for ensuring safety of work persons. These are directly specified or indirectly referred to in the codes of regulations and rules made under the Mines Act. By virture of its very terms of reference, the Committee has confined itself to only safety equipment and material. Lists of these items are given in Appendix A (Coal Mines) and Appendix B (Metalliferous Mines).

'Capital Equipment' and 'Consumable Material'

7. A perusal of these lists would show that mine safety equipment and material can be classified broadly into those items which are consumed from day to day (*i.e.* Consumable Material) and those which are provided only once—or, more correctly, only at infrequent intervals (*i.e.* Capital Equipment) Brattice cloth, incombustible dust, miners' boots etc. fall in the former category while most machines can be taken to fall in the latter category.

Spares

8. Machines and other similar equipment require occasional replacement of parts; and easy availability of spares of the right specifications forms an important aspect of the whole problem. Spares are required not only for the machinery still to be installed but also for the machinery already in use in the industry. In fact for some time to come, the main requirements of spares would be in respect of machinery already installed in the past—most of which is of foreign make.

Assessment made by Coal Council

9·1. This Committee recalls that the Committee on Production and Preparation (of the Coal Council) had, in 1959, constituted a Sub-Committee with composition and terms of reference as given in Appendix C, to assess the requirements of both the coal and the metalliferous mining industries, for mining machinery and equipment for the Third Five Year Plan. The Sub-Committee had not been able to make any recommendations either in respect of the requirements of metalliferous mining industry or about the existing and required manufacturing capacities in the country. It had thus confined itself to drawing up a list of mining machinery and equipment required by the coal mining industry.

9·2. In respect of coal mining industry, the Sub-Committee had thought it better to fix two standard units of production, one for underground mining and another for opencast mining; and to make an assessment separately for each of these units. It had for this purpose decided upon a unit of one million ton annual production of coal from underground mining (from four mines, each producing about 20,000 tons of coal per month) and a unit of 2·5 to 3 million tons annual production of coal from opencast mining. The assessment arrived at by the Sub-Committee, as amended by the parent Committee on Production and Preparation, is attached as Appendix D (Mining Machinery and Equipment for Underground Mining) and Appendix E (Mining Machinery and Equipment for Opencast Mining).

10. The items included in the assessment lists mentioned above include many items of safety equipment as well. As this assessment was made after full consideration of all the factors involved, this Committee decided to accept the same, subject to marginal changes considered necessary as a result of the information received in reply to the questionnaires issued to mine managements. In case of the remaining items, the Committee has made its own assessment.

Approximate Price and Life of Safety Equipment

11. Approximate price of some items of safety equipment and material (and their life in use) is given in Appendix F.

III. REQUIREMENTS OF COAL MINES

12. The requirements of coal mines for safety equipment worked out in accordance with the procedure laid down in para 10 above are given in Appendix G (for a standard unit of *one* million ton annual production from underground workings) and Appendix H (for a standard unit of *one* million ton annual production from opencast workings). As may be seen, underground workings in gassy mines have maximum requirements for safety equipment, while the requirements of opencast mines are only nominal. These assessments are to be read with the following explanatory notes :

Explanatory Notes

13·1. The current practice in all countries is to use only EQS. type of explosives (in preference even to 'Permitted' explosives) in gassy mines. Also, as despite great improvements in the development of safe explosives for use in mines, ignitions and explosions from this cause continue to occur, special efforts are now being made to develop other methods of breaking coal. Cardox and Hydrox are examples of substitutes which were developed decades back and whose use in gassy mines is now fast extending. Among the newly developed substitutes, mention may be made of the 'Air, Breaker'. For the sake of safer mining it is necessary that the use of such substitutes is actively encouraged—by permitting liberal imports, to start with. Later on, when the demand of a particular equipment increases arrangement should be made for its manufacture in the country.

13·2. The estimates in respect of FLP motors are exclusive of such motors as are fitted as integral parts of mining machinery such as coal-cutting machines, drills etc.

13·3. The Coal Mines Regulations require all suspension gear to be replaced at 10-year intervals.

13·4. Regarding winding and haulage equipment, it is to be kept in mind that most of the production from underground mines in the public sector during the Third Plan period is likely to come from 'incline-mines'. Also most of the new underground mines in the public sector are being laid out for using machinery of trackless type—so that conveyors, and not haulages, would be used for transport of coal. On the other hand, most of the extra production in the private sector is likely to come from the expansion of existing units which are mostly 'shaft-mines, and make extensive use of rope haulages. The requirements listed in Appendices G and H are average estimates, based on these vital differences in the nature of mining development in the public and private sectors.

13·5. Due to the non-availability of timber of the right quality, it may be necessary in the near future for the mining industry to start thinking about using the more costly steel support. The use of such support would, for obvious technical reasons, remain confined (at the beginning at least) to the thinner seams and to the 'longwall' type of working faces.

13·6. Pumps and pipes are not items of safety equipment in the strictest sense, but are included in our lists as they are vitally connected with the danger of inundation. Pipe ranges are also required in mines in large quantities to transport water for alaying coal dust.

13·7·1. In due course, it is expected that all mines, whether gassy or not, would switch over to the use of electric cap lamps for the sake of providing better lighting.

13·7·2. As regards flame safety lamps, besides officials and operators of electrical machinery, one-tenth of all face-workers in gassy mines would also have to be supplied with the same (according to one of the important recommendations of the Safety in Mines Conference).

13·8. Though at present all rescue apparatus is maintained at the Central Mine Rescue Stations, it is felt that, in the early future, such equipment may also have to be kept at many more sub-stations' sited all over the underground mining areas.

Assumptions

14·1. To project the unit standards of requirements laid down in Appendices G and H into future annual requirements, it is necessary to assume output figures for each year of the Third Plan period, so as to reach the target figure of 97 million tons in 1965-66. Assuming :

(*i*) that, of the 97 million tons coal output in 1965-66, as much as 24 million tons (about 25%) would be from opencast workings compared to about 17% at present;

(*ii*) that almost two-thirds of the additional output from underground workings would come from gassy mines; and

(*iii*) that the demand for safety equipment for new mines opened every year would be practically uniform over the next five years;

we arrive at the following figures:

TABLE I

Assumed Annual Outputs for the Third Five Year Plan Period

(Million tons)

	Actual* Output 1960	Expected Output				
		1961	1962	1963	1964	1965
1. Opencast Mines ..	8·8	12	15	18	21	24
2*a*. Underground non-gassy mines	28·4	31	33	35	37	39
2*b*. Underground gassy mines	14·4	18	22	26	30	34
TOTAL	51·6	61	70	79	88	97

*Provisional figures.

TABLE II

Assumed increase over the previous year's output

(Million tons)

		Achieved* in 1960	1961	1962	1963	1964	1965
1.	Opencast Mines ..	1·4	3	3	3	3	3
2.a	Underground non-gassy mines	2·9	2	2	2	2	2
2.b	Underground gassy mines	0·3	4	4	4	4	4

*Provisional figures

14·2. Production of lignite is expected to increase from 0·4 million tons in 1960 to 5·5 million tons in 1965-66. Whole of this output is expected to come from opencast workings.

14·3. The production of crude petroleum in India is also expected to go up from about 0·4 million tons in 1960 to about 3 million tons in 1965-66. Whole of this production is expected to come from oil-wells, for which requirements of safety equipment are quite small and consist mainly of fire-fighting and first aid' equipment.

15. In calculating the future total annual requirements, it has been further assumed that items of 'capital equipment' would be required one year ahead of production (some of these, like winding equipment, suspension gear etc. would in fact be required 2-3 years ahead), while items of consumable material would be required during the year of production itself.

Total Annual Requirements

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16. The figures for safety equipment and material required by coal mines (including lignite mines) arrived at as a result of the above assumptions, are consolidated in Appendix I.

IV. REQUIREMENTS OF METALLIFEROUS MINES

17. The assessment of requirements of metalliferous mines for the Third Five Year Plan is still more difficult as over 40 types of ores and minerals are produced in India (resulting in a very diverse variety of working conditions) and as the targets for production of these minerals for 1965-66 have not yet been fixed. A reply received from the Planning Commission to a request for information in this connection made in January 1961, is placed at Appendix J.

Assumptions

18·1. The Committee was thus left to make its own estimates for future production of various ores and minerals. Assuming a general two-fold increase over the next years, with the exceptions that :

(*i*) production of manganese ore and limestone etc. would increase practically three-fold to meet the large rise of demand from the steel plants and cement factories etc.; and

(*ii*) production of gold and mica would remain more or less at the present levels (most of the mica is produced for world consumption, India is supplying about 80% of the total world demand) :

we get the following targets for the Third Five Year Plan :

Mineral (Production Unit given in parenthesis)	1960		Estimated Production in 1965-66	Remarks
	Employment (000's)*	Production**		
Managanese Ore (m. tonne)	58·7	1·15	3·5	Mainly opencast workings.
Iron Ore (m. tonne) ..	56·2	10·7	32·0	All opencast workings.
Limestone, Dolomite & Gypsum (m. tonne).	47·3	13·3	35·0	Do.
@ Mica (1000 tonne) ..	32·5	28·8	30·0	Mostly underground mine.
Gold (1000 Kg.) ..	16·5	5·0	5·0	From four large underground mines. No expansion envisaged.
Copper Ore (m. tonne)	4·5	0·5	1·0	From underground mines.
Magnesite (m. tonne) ..	5·4	0·15	0·3	Mostly opencast workings.
Chromite (m. tonne) ..	2·2	0·10	0·2	
Bauxite (m. tonne) ..	2·2	0·36	0·7	
Fire Clay (m. tonne) ..	2·3	0·26	0·5	
China Clay (m. tonne)	5·3	0·25	0·5	
Steatite (m. tonne) ..	2·3	0·06	0·1	

*Based *pro rata* on 1959 figures, and not actuals.

**Provisional figures supplied by Indian Bureau of Mines.

@1959 figures.

18·2. Except for gold ore, copper ore, some atomic minerals and mica, and about 10% of manganese ore, almost the whole production of the above ores and minerals would come from opencast mines. Also in view of the nature of underground workings in metalliferous mines, it would be seen that their requirements for safety equipment also would be marginal except for ventilating, winding and first-aid equipment.

18·3. In preparing the estimate for total requirements of metalliferous mines, it has been further assumed that, on an average:

(*i*) the equivalent of only 2-3 new underground metalliferous mines (employing 500—1,500 persons each) would be opened annually during the next 5 years and that most of these would be comparatively shallow; and

(*ii*) the annual increase of production of ores and minerals from opencast workings during the Third Plan period would be of the order of 8-9 million tons.

Requirements

19. Proceeding on the same basis as in the case of coal mines, the figures for safety equipment and material required by metaliferous mines work out as given in Appendix K (for a unit of one million ton of ore and minerals by opencast methods) and Appendix L (Total Annual Requirements).

V. INDIGENOUS MANUFACTURE

20 It goes without saying that it should be our aim to become completely self-sufficient as regards requirements of safety machinery and equipment for a basic industry like mining. The only exceptions are items whose manufacture is highly specialised or whose demand is not sufficient for economic production within the country. Appendix M gives the total estimated annual requirements of the mining industry for different items of Safety Equipment and Material for the year 1961 and 1965.

21. Despite considerable correspondence (and, in some cases, also discussions) with the various manufacturers and with the Development Wing of the Ministry of Commerce and Industry, it has not been possible for the Committee to obtain anything like a complete picture of the various schemes for indigenous manufacture of mine safety equipment and material. It has also proved extremely difficult to obtain proper data for raw material requirements for such manufacture. However, whatever information was collected, is consolidated below :

'Permitted' explosives etc.

22·1·1. Messrs. Imperial Chemical Industries (India) Private Ltd., have started a subsidiary, *Messrs. Indian Explosives Ltd.*, to manufacture explosives in India. Their factory, which is located at Gomia in the Bokaro-Kargali coalfield in Hazaribagh district in the State of Bihar, is at present designed to manufacture only non-permitted explosives of the gelatinous type. Since the start of production in November 1958, the following quantities have been manufactured:

	Short tons
1958	219
1959	3,780
1960	6,500

The designed capacity of the Gomia plant is 5,000 short tons of gelatines (non-permitted) per year. As may be seen from the production figures given above, this capacity has already been exceeded.

22·1·2. It must be mentioned here however that, besides mining purposes, large quantities of explosives are also required for other uses—mainly by the defence services and the civil engineering authorities. For the sake of comparison it may be mentioned that during the one year period from October, 1959 to September, 1960, a total of 10,000 short tons of high explosives were sold by ICI in India, out of which only 7,500 short tons were supplied to regular mining customers. Out of this, 'permitteds' amounted to 2,366 short tons (including 630 short tons of EqS type explosives).

22·1·3. Arrangements are already in hand to increase the production capacity of the Gomia plant to 15,000 short tons per year of gelatines and powders (including Permitteds and EqS types) and Ammonium Nitrate—based explosives, by 1962-63).

22·2. Arrangements should also be made for the indigenous manufacture of detonators (including electric detonators), shortfiring cable and, if possible, exploders and exploder batteries.

22.3. Attention may also be invited here to the need, in course of time, for indigenous manufacture of 'substitutes for explosives' for use in gassy coal mines—see para 13.1 above.

Flame-proof Equipment

23.1. According to information sent on 10th January 1961, *Messrs. Heavy Electrical Ltd.*, Bhopal (a Government of India undertaking) are considering the manufacture of the following electrical plants (including FLP equipment) for the mining industry:

(*a*) Switchgear suitable for 3300 volts and 400 volts.

(*b*) Induction Motors and Control gear.

(*c*) Gate-end Boxes etc.

The Heavy Electricals have stated that the "production programme for each item has to be planned on the requirements, and we ourselves are seeking information about the country's demand for such equipment." The earliest delivery they can at present promise is by 1963.

23.2. *Messrs. Kirloskar Electrical Co. Ltd.* (of Post Box 1017, Bangalore-3) are already manufacturing an FLP motor (fan-cooled) of 10 h.p., 1500 r.p.m. rating, in Frame FQB—180b—which has already passed all tests for motors for Group I and II gases according to BSS 299. The complete range of FLP motors, all fan-cooled, proposed to be manufactured by this company (in technical collaboration with Messrs. Brush Electrical and Engineering Co. of U.K.) is given below:

Frame	Rating (h. p.)			
	2 Pole	4 Pole	6 Pole	8 Pole
FQB—112b	2.2	1.5	1.1	—
FQB—132b	5.5	3.7	2.2	1.5
FQB—160b	11	7.5	5.5	3.7
FQB—180b	18.5	15	10	7.5
FTQB—1	25	22	18.5	15
FTQB—2	45	37	30	22
FTQB—3	65	55	45	30
FTQB—4	—	75	55	37

The company propose to manufacture 100 units upto frame FQB—180, during 1961. During the next two years, they intend to gradually develop the remaining larger frames. The expansion programme is scheduled to be completed by 1963 when they expect to be manufacturing FLP motors upto 100 h.p. sizes.

The Company also state that with their present capacity, they can manufacture 400,000 h.p. of Induction motors, mainly of non-FLP type.

23.3. *Messrs. Elmechs & Colliers Private Ltd.* (of 36 B.K. Shaw Market, 23 Canning Street, Calcutta-10) have indicated that they propose to manufacture:

(*a*) FLP Air Circuit Breakers (upto 100 amps);

(*b*) FLP Mining Bells and Transformers; and

(*c*) FLP Cable Glands and Joint Boxes.

They have, however, not yet finalised their programme of manufacture.

23.4. *Messrs. Siemens Engineering & Manufacturing Company of India Private Ltd.*, (of G.P.O. Box No. 715, 24 Chittaranjan Avenue, Calcutta-12) have indicated that their associates, Messrs· Bharat Bijlee of Bombay, have a licence agreement with Messrs. Siemens Schuckertwerke A.G., Erlangen, West Germany for progressive manufacture of motors (including FLP motors) and transformers, according to Siemen's designs. Their motors would be of the 'squirrel cage' type, and will initially by of 5, 10, 20 and 50 h.p. sizes. They will be of the fan-cooled type and will have a synchronous speed of 1500 r.p.m. The company hope that these motors will be available in the market towards the middle of 1960. They have, however, not yet finalised the scheduled quantities to be manufactured.

23.5. *Messrs. Kilburn & Company Private Ltd.* (of Post Box No. 61, 2 Fairlie Place, Calcutta-1) have already started manufacturing FLP switchgear of the following types:—

(*a*) Oil Circuit Breakers upto 100 amps.
(*b*) Oil-immersed Starters upto 55 h.p., at 550 volts.
(*c*) Air-break Contractor type Starters upto 10 h.p.

In their next manufacturing programme, the Company propose to manufacture FLP Oil Circuit Breakers upto 300 amps. and Starters upto 125 h.p. They expect to be able to deliver even these higher ranges by March, 1961.

23.6. *Messrs. Meameco Private Ltd.* (of Post Box No. 33, Dhanbad), have the following equipment on their programme of manufacture:

(*a*) FLP Switchgear
(*b*) FLP Controllers
(*c*) FLP Transformers upto 10 kva (medium pressure to low pressure)
(*d*) FLP Signalling Equipment
(*e*) FLP Resistances
(*f*) Earth Leakage Protective Apparatus
(*g*) Core Balance Transformers.

This list merely represents a tentative programme and a firm decision would be taken by the company only after a survey of the demand has been completed.

23.7. *Messrs. Martin Burn Ltd.*, have also indicated their intention to start manufacturing FLP equipment in India. They too have, however, not yet finalised their plans in this connection.

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23.8. *Messrs. English Electrical Company Ltd.* (of Post Box No. 2224, D3 Gillander House, 8 Netaji Subhas Road, Calcutta-1) and *Messrs. Greves, Cotton and Parkinson Private Ltd.* (of Post Box No. 166, 4 Mission Row Extension, Calcutta-1) do not, as yet, have any plans to manufacture FLP equipment in India.

23.9. It would be pertinent to point out here that though most of the electrical equipment already in use in mines is of 550 volts, equipment of this voltage is not on the manufacturing programme of Heavy Electricals. Mention may also be made here of the fact that, in many countries, the range of medium voltage has now been extended to about 1100 volts. Intending manufacturers of FLP electrical equipment in India might therefore keep this development in mind.

23.10. It has not been possible for the Committee to collect any information about the programme of manufacture of electrical cables (of both armoured and trailing types) in India.

Winding Equipment

24.1.1. *Messrs. Heavy Engineering Corporation Ltd.*, (Coal Mines Machinery Project) Durgapur have the following items of safety equipment under this heading on their manufacturing programme:

(*a*) Safety Hooks	100 per year
(*b*) Keps	24 sets per year

They expect to make this equipment available in the market by the end of 1963.

In addition, they would also be manufacturing a number of Automatic Contrivances, Continuous Speed Recorders and Depth Recorders for the winding engines manufactured by them. They will, however, *not* manufacture any rope cappels.

24.1.2. *Messrs. Meameco Private Ltd.*, (of Post Box No. 33, Dhanbad) have the following items of safety equipment relating to winding on their manufacturing programme:

(*a*) Rope Cappels
(*b*) Safety Hooks
(*c*) Distribution Plates
(*d*) Chains and D-links
(*e*) Automatic Contrivances
(*f*) Depth Recorders
(*g*) Keps.

The above list merely indicates a tentative programme and the company would take a firm decision only after a survey of demand has been completed.

24.1.3. *Messrs. Kilburn & Co. Private Ltd.* (of 2, Fairlie Place, Calcutta-1) shortly expect to start full-scale manufacture of rope cappels. A proto-type has already passed the necessary tests etc. carried out in the presence of the Government authorities concerned.

Chains

24.2. An enquiry from the various manufacturers of chains and links in India has elicited the following information:

24.2.1. *Messrs. Indian Link Chain Manufacture Ltd.* (of Bombay-Agra Road, Bhandup, Bombay-78) already have facilities for making steel chains upto ¾" diam. They shortly intend to instal machinery for the manufacture of chains upto 13/16" diam. Their installed capacity at present is for 480 tons of chains per year, and this is expected to go upto 780 tons per year with the completion of their expansion programme. Production in 1959 was 137 tons.

24.2.2. *Messrs. Ashok Steel Chain Manufacturing Co.* (of 6 Sewree Cross Road, Bombay-15) are manufacturing electrically-welded M.S. chains (made on automatic bending machines and butt-welded on automatic welding mahines) in sizes 1/8" diam to ¾" diam. Over this size and upto 1¾" diam. they hand-forge the chains and arcweld the links. Their installed capacity is for manufacture of 588 tons per year.

24.2.3. It would appear from the information received that the indigenous chains are not yet suitable, as regards size as well as quality, for use in mine suspension gear—on which depend the lives of hundreds of thousands of persons going underground daily.

Annealing facilities

24.3. It is necessary that all suspension gear should be properly annealed and heat treated at periodic intervals. Proper facilities for this purpose should therefore be provided in mining areas. An enquiry from the engineering concerns in the coalfield areas has elicited the following information:

24.3.1. *Messrs. Barakar Engineering & Foundry Works Ltd.* (of Nirshachati, District Dhanbad) and *Messrs Geo Miller & Co. Private Ltd.* (of 7 Hastings Street, Post Box No. 564, Calcutta) do not have the necessary arrangements for undertaking this type of work.

24.3.2. *Messrs. Indian Iron & Steel Co. Ltd.* have indicated that, though at present they do not have spare facilities for annealing, they may be in a position to undertake such work in future. *Messrs Kumardhubi Engineering Works Ltd.* (of Kumardhubi, Distict Dhanbad) may also be able to undertake this work if the demand is adequate.

24.3.3. *Messrs. Ekra Engineering Works* (of P.O. Bansjora, District Dhanbad) claim to be in a position to take up jobs of annealing suspension gear, as also *Messrs. Balmer Lawrie & Co. Ltd.* (of Grand Trunk Road West, Asansol).

24.3.4. *Messrs. Kilburn & Co. Private Ltd.*, (of 2 Fairlie Place, Calcutta) have arrangements for annealing cage suspension gear at a leading Calcutta Workshop. In fact, they have already carried out this work on behalf of several coal companies.

Telephones etc.

25. The sole responsibility for meeting all requirements for telephones in India (inculding mining type telephones) is that of *Messrs. Indian Telephone Industries Ltd.*, Duravaninagar, P.O. Bangalore. An enquiry from this concern has elicited the information that they have not yet included mining type telephones in their production programmes, but that they do intend to do so in the near future. In the meanwhile, all demands for mining type telephones referred to them are being met by imports. The following orders were placed with them during the past three years from different types of mining telephones:

Type	1957-58	1958-59	1959-60
(i) J.L. 11600 Magneto Mining Telephones	15	..	..
(ii) J.L. 11601 Magneto Mining Telephones	10	74	225
(iii) N. 2974-A Magneto Mining Telephones	..	52	50

Haulage Equipment

26.1. Safety equipment under this heading includes haulage rope cappels, haulage clips and intercoupled runaway switches and stop blocks, etc. All of these are of easy manufacture and are in fact already being made in mine workshops.

26.2.1. Another item under this heading is fire-resistant conveyor belting, *Messrs. Goodyear Tyre & Rubber Co. of India* have been able to produce 'Neoprene' conveyor belting to US Bureau of Mines specifications, whose use has already been approved by the Chief Inspector of Mines in non-gassy mines (as well as in gassy mines until suitable PVC type fire-resistant belting is manufactured in the country). The belting can be produced in widths ranging from 12″ to 48″ with 3 to 7 plies, and with the thickness of top and pulley covers ranging from 3/64″ to ¼″.

26.2.2. *Messrs. Asbestos, Magnesia & Friction Materials Limited* (of 7 Hasting Street, Calcutta-1) also intend to make PVC-coated conveyor belting in India.

Wire Ropes

27. Information regarding the capacity for manufacturing wire ropes in India has been received only from two firms. In this connection, it may perhaps be mentioned that wire ropes are needed for several non-mining uses also, including shipping and wherever cranes and heavy earth-moving machinery is used. Indigenous steel ropes have already been in use in the country for nearly three years, mainly by non-mining users. In mining, their use uptil now has been restricted to haulage purposes and to non-manwinding shafts.

27.1. *Messrs. J.K. Steel Ltd.* (of 7 Council House Street, Calcutta) have an installed capacity of 3,000 tons of wire ropes per year on two-shift basis. After completion of their proposed expansion programme, this would increase to 6,000 tons per year. Their production in 1958-59 was 650 tons and in 1959-60 955 tons.

The necessary raw material *i.e.* high carbon wire rod is being imported by them, since it is not at present manufactured in India.

27.2. *Messrs. National Rolling & Steel Ropes Ltd.* (of Nicco House, 1 & 2 Hare Street, Calcutta-1) have an installed capacity for manufacturing 2,000 tons of wire ropes of various sizes and types per year, and this is expected to go up to about 3,000 tons per year on completion of their expansion programme. Their production for the past three years has ranged between 1,000 tons and 1,500 tons per year.

The necessary raw material *i.e.* high carbon wire rod of various carbon ranges (from 0.45% to 0.80%) is being imported. The company also import high tensile galvanised wire for the construction of galvanised ropes for want of galvanising facilities at their works.

27.3. The requirement of mining industry for manila ropes is not large, and can easily be met from reliable indigenous sources.

Mine Support

28.1. The annual requirement of the mining industry for prop withdrawers is only about 250 per year. This item is of quite easy make and could therefore be manufactured indigenously by any of the large engineering workshops in India.

28.2. The industry requires large quantities of timber, mainly for purposes of supporting strata. For this purpose it is necessary that the 'props' used be straight and thick, and of uniform section. The material being made available to the mining industry is, however, of much poorer quality. It would therefore appear necessary for this matter to be brought to the notice of appropriate Central and State Government departments so that action is taken to see that timber of the right quality and in the required quantities is made available to the mining industry.

28.3. In view of the difficult timber position it may become necessary, in due course, to change over to steel mine supports. By the time this happens, however, sufficient steel is expected to be made within the country to meet all requirement.

Pumps etc.

29.1. Small pumps are already being made within the country. It is necessary, however, that the range of indigenous manufacture is increased to include the large capacity pumps required by the mining industry.

29.2. Most requirements of the mining industry for small diameter and low pressure pipes are already being met from indigenous sources. Pipes about 5" diam. are however still not being manufactured in sufficient quantities, while there is no indigenous production at all of pipes suitable for withstanding high pressures.

Lighting Equipment

30.1.1. Oldham electrical cap lamps are already being manufactured in India at the Madras factory of *Messrs. Oldham & Sons (India) Private Ltd.* (of 5 McLean Street, Madras-1). At present, the firm is manufacturing 3,000 cap lamps (plus 2,500 to 3,000 spare batteries) on a single-shift basis. The company have indicated that equipment is already installed in their factory for stepping up production to 4,000 cap lamps per month on single-shift basis—provided import of necessary components for the same is permitted. The number of cap lamps manufactured at this factory since its inception is given below:

1954-55	1,711
1955-56	2,013
1956-57	9,199
1957-58	11,974
1958-59	12,776
1959-60	20,908

30.1.2. The manufacture is under a progressive manufacturing scheme and about 85% of components (by value) are already being manufactured within the country. A list of items still imported is given in Appendix N-A .

30.1.3. Appendices N-B and N-C give, respectively, the estimated production of spare parts for 1960-61 and the quantity of spare parts actually manufactured during the period 1954—60.

30.2. The mining industry requires about 5,000 flame safety lamps annually in the foreseeable future. The quantity appears large enough to justify the manufacture of such lamps in India under license. Facilities are also required for the manufacture of the fairly large quantities of spares (mainly wire gauzes and glasses) required for the 30,000 flame safety lamps already in use in mines. In this connection, it may perhaps be mentioned that *Messrs. Elmechs & Colliers Private Ltd.* (of 23, Canning Street, Calcutta-1) have indicated their interest in manufacturing spare parts for safety lamps.

Ventilation Equipment

31.1.1. *Messrs. Heavy Engineering Corporation Ltd.* (Coal Mines Machinery Project) of Durgapur have the following types of fans on their manufacturing programme:—

	Per year
(*a*) Main fans for circulating 2,266 to 2,832 cu.m/min. of air at 2.54 to 3.81 cm. water gauge	20
(*b*) Main fans for circulating 4,248 to 7,080 cu.m/min. of air at 3.81 to 6.35 cm. of water gauge	30
(*c*) 7.5 h.p. Booster Fans	50
(*d*) 5 h.p. Booster Fans	50

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These fans are expected to be available in the market by the end of 1963.

31.1.2. *Messrs. Meameco Private Ltd.* (of Post Box 33, Dhanbad) have also indicated that their tentative programme of manufacture includes mine fans and water gauges. A firm decision for such manufacture by them would, however, be taken only after a survey of demand has been completed.

31.1.3. *Messrs. Keymer Bagshawe & Co.* (*India*) *Private Ltd.* (of 22, Strand Road, Post Box No. 399, Calcutta-1) are already manufacturing axial flow fans at their Rishra Works. The firm has experience since 1939 of manufacturing centrifugal and propeller type fans in India for non-mining uses, and they now intend to enter the mining market. They claim that they are in a position to manufacture axial flow fans of large diameters and high capacities. Their fans, however, are still to be tried under mining conditions.

Uptil now the company have manufactured only 6—8 axial flow fans for surface use. They state however that they are in a position to supply 40—50 such fans per year with their existing plant.

The company can also supply small cased axial flow fans (of 19" dia. and above), with direct-coupled motors, for underground use.

Fire-resistant Brattice Cloth etc.

31.2.1. The present requirements of the mining industry for fire-resistant brattice cloth is of the order of 300,000 yards per year; and this is likely to increase nearly two-fold during the next five years. In addition, about 100,000 yards of flexible air ducting is required at present; and this requirement too is likely to double in five years' time.

31.2.2. The absence of any standard specifications for fire-resistant brattice cloth is coming in the way of hessian cloth manufacturers starting the manufacture of such cloth. This matter has since been referred to the Indian Standard Institution.

After considerable experimentation, on suggestions made by the ICI technical department, Messrs. Bengal Coal Co. Ltd., have chosen the following solution for 'fire-proofing' hessian cloth to meet the test requirements laid down in SMRE Report No. 81.

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	(For 100 gallons of water)
Amm. Di-hydrogen Phosphate	100 lbs.
Amm. Sulphate	40 lbs.
Amm. Chloride	30 lbs.
Boric Acid	26 lbs.
Borax	16 lbs.
Lissapol D Paste	2 lbs.

Copper salt is added as preservative. The fire-proofing is adversely affected by leaching but, on the other hand, wet hessian cloth would not apparently catch fire easily.

A summary of some existing specifications relating to fire-proofing of textiles in general (and not specifically for hessian cloth) supplied by the India Jute Mills Association Research Institute (17, Taratola Road, Calcutta-27, is given in Appendix

O-A. A note on Fire-proofing Jute (based on a British Trade Research Association Patent) supplied by the Indian Central Jute Committee (4, Hastings Street, Calcutta-1) is also attached as Appendix O-B.

31.2.3. In the meanwhile, several firms have indicated their interest in undertaking manufacture of fire-resistant brattice cloth. These include:

(*a*) Messrs. East India Rubber Works Private Ltd., 161 Chittaranjan Avenue, Calcutta-7;

(*b*) Messrs. Goodyear Tyre & Rubber Co. Private Ltd., (Post Box No. 2670, G.P.O.) 209, Lower Circular Road, Calcutta-17; and

(*c*) The Jute Mill department of Messrs. Andrew Yule & Co. Ltd.

Messrs. H. Harley & Co. Ltd. (of 5, Delhi-Serampore Road, Entally, Post Box No. 7811, Calcutta) already manufacture fire-retarding brattice cloth (to their own specifications and standards) for supply to mining users. They claim that the brattice cloth manufactured by them "can stand a 3" blue flame of a Bunsen burner and the cloth does not flare up but only chars away, that is, turns into ash." Their annual capacity for production at present is about 150,000 yards and, during the past three years, they have produced an average of 60,000 yards annually.

They, however, state that two of the chemicals required namely, Sulphate of Ammonia and Pospos No. 1 (an ICI product) are not easily available. The latter has in fact to be imported.

31.3. It has not been possible for the Committee to obtain information about indigenous capacity for manufacturing items like gas analysing apparatus, methanometers, anemometers and hygrometers etc. As may be seen from Appendix M, however, the requirements of the mining industry for these equipments are not large—so that unless they are also required by some other users in the country, they will perhaps have to continue to be imported from abroad.

Equipment for Dust Control, Fire-Fighting & Rescue etc.

32.1. Adequate manufacturing facilities exist within the country for the manufacture of fire extinguishers and other fire-fighting equipment. (See Appendix P—which is based on information furnished by the Development Wing).

32.2. The annual requirements for Rescue Apparatus is not very large and, therefore, it would perhaps be necessary for this equipment also to continue to be imported for some time.

32.3. The present requirements of the mining industry for incombustible dust (for treating the roadways in coal mines against the explosion hazard) is about 40,000 tons per year; and this is expected to rise to about 80,000 tons per in five years' time. The specifications for this dust, as laid down in the Coal Mines Regulations, 1957 are given below:

"The dust shall be:

(*i*) free from any material containing injurious free silica;

(*ii*) of such fineness and character that it is readily dispersable into the air and that, when used in places which are not directly wetted by water from the strata it does not cake but is dispersed into the air when blown upon with the mouth or by a suitable appliance; and

(*iii*) as far as practicable, light in colour."

Suitable limestone and gypsum, which are usually used for such purposes in other countries, are not yet available in the country in adequate quantities. *Messrs. Indian Patent Stone Co.* (*Private*) *Limited* (of 55, Canal East Road, Belliaghatta, Calcutta-10) have, however, indicated that they are in a position to supply about 20—30,000 tons of materials meeting the above specifications, every year. The reference is probably to sludge from paper mills.

Protective Equipment

33.1. The manufacture of *miners helmets* is in the production programme of many companies, including the following:

(*a*) *Messrs. Indian Cardboard Industries Ltd.* (Managing Agents, Messrs. Kilburn & Co. Private Limited) 2, Fairlie Place, Post Box No. 61, Calcutta. They expect shortly to be able to produce about 1,500 helmets per month on single-shift basis.

(*b*) *Messrs. Mine Service Corporation,* Murgasal, Asansol. They are at present selling Duraloy safety helmets made by a plastic manufacturer in Calcutta to their design. The present installed capacity is 15,000 helmets per year and this can conveniently be doubled. Manufacture at the rate of 500 helmets per month was started in November 1960. The helmets are made from special rigid PVC which is imported from U.K.

(*c*) *Messrs. Supreme Industries Ltd.*, Wadala, Bombay-31. They have not yet finalised their programme of manufacture.

(*d*) *Messrs. Dominion Plastics Industries,* Chowpatty Chambers, Bombay-7.

(e) *Messrs. Bird Company Private Ltd.*, 1, Indian Exchange Place, Calcutta-1.

In this connection, it may perhaps be mentioned that only Heavy Duty helmets (to specifications laid down in BSS 2826: 1957) are considered suitable for use in mines.

33.2. Adequate capacity for manufacturing *miners' boots* already exists in the country. Other items of protective equipment required by the mining industry can also be manufactured to specifications laid down.

Medical Equipment

34. Facilities exist within the country for manufacture of all requirements of the mining industry for ambulance vans and first-aid kits. It is, however, advisable if the likely requirements of the mining industry are brought to the notice of the manufacturers so as to enable them to design and produce equipment to suit mining conditions.

Survey Equipment

35. Theodolites, dials and levels are already being manufactured within the country, but uptil now, the quality of the equipment is not very high. Till the quality of indigenously-made equipment improves, it would be necessary to continue importing survey instrument made by reputable manufacturers abroad.

36. As may be seen from above, there are many items of mine safety equipment which are either not being manufactured in the country at all or whose manufacture is still inadequate—either in respect of quality or of quantity, or both. It is, therefore, necessary that proper arrangements should be made within the country for the manufacture, to the desired quality and in the required quantities, of all our requirements of mine safety equipment and material—subject, of course, to the limitations mentioned in para 20 above.

VI. THE PROBLEM OF SPARES

37.1. After a particular machinery or equipment has been installed and has been in use, it starts requiring repairs and replacement of certain parts after some time. For ensuring continued operation and usefulness of such machinery, it is necessary that the replacement is made properly and in time for any delay in such replacement would mean keeping the whole machine or equipment out of use. And more often than not, the part required may be quite a small one, costing only a fraction of the price of the whole machine. Mining machinery is usually a rather costly one and, for its continued satisfactory operation, it should be ensured that spare parts of the right quality are readily available to the users.

37.2. The problem of spares is faced by every mine which has been in operation for a few years but, the older a piece of machinery, the greater is its dependence on spare parts. 'Spares' are thus vital not only to increased production, but also to the maintenance of existing production levels.

38. As we have seen above, ready availability of spares of the right quality is essential to the working of any machinery. In respect of safety equipment and machinery, however, they are absolutely indispensable. Thus, if a haulage engine requires a spare part, the part could perhaps be turned out at the local workshop and used till the proper replacement has been received. But if, say, a safety lamp gauze needs replacement, only a gauze of the approved design and make can be used. And till such a gauze can be obtained, the whole lamp becomes unsafe and has to be kept out of use.

Most spares to be imported

39. Most machines and other safety equipment used at present in mines are of foreign manufacture. In many cases, the various parts are of proprietary design and should necessarily have to be imported. In the greater interests of safety (as well as of production), it is necessary, therefore, that liberal facilities are provided for timely import of necessary spare parts in adequate quantities. Foreign exchange spent on spares is, for obvious reasons, better utilised than that spent in purchasing new complete equipment.

Indigenous manufacture of Spares

40.1. In the meanwhile, avenues must be explored for the indigenous manufacture of suitable spare parts of mine safety machinery and equipment. This can be done satisfactorily only in the case of standardised equipment and in case of parts whose requirements are fairly high. Here also, it must be kept in mind that safety equipment is not only likely to be of proprietary design but may also be subject to statutory approval. In such cases, the foreign manufacturers of the equipment would have to be pursuaded to make arrangements (in collaboration, if necessary, with some existing manufacturing units in India) for the manufacture of suitable spare parts in this country. Till then, such parts will have to continue to be imported.

40.2. It also follows from above that, in any programme of indigenous manufacture of safety equipment (or, for that matter, of any machinery and equipment), adequate capacity for manufacturing spare parts should be provided right from the beginning.

VII. IMPORT OF MINING SAFETY EQUIPMENT

41. As may be apparent from Section V, there is at present a very large gap between the requirements of the mining industry for safety equipment and the indigenous capacity for manufacture. Though this gap is likely to reduce with the passage of time, it will be necessary for us to continue to import mine safety equipment—and necessary spare parts for the same—for quite some time.

42. In order to ensure that safety of persons employed in the most hazardous of peace-time industries is not jeopardised due to non-availability of safety equipment and material, it is vital that the mining industry's requirements for import of safety equipment and of spare parts are met *in full* and *in time*. Occasions have not been infrequent in the past when the Mining Industry had had cause for complaint in this respect. Such causes need to be thoroughly investigated and removed.

Procedure for importing equipment

43. The import policy of the Government of India is laid down, for half-yearly periods, in 'Red Books' governing Import Trade Control Policy. Relevant extracts relating to the procedure to be adopted for obtaining a licence for import are given in Appendix Q (Established Importers) and Appendix R (Actual Users). In short, imports can be made by general dealers for open sale from ready stock. Import licences for this purpose are granted only to 'established importers'. In addition, every 'actual user' can import his requirements after obtaining an Actual User's Licence.

44. For import through *established importers*, a ceiling is fixed in respect of every item during every licencing period. Import quota for every established importer is fixed on the basis of past imports made by him. For this purpose, certain basic periods are fixed—different for different items. After all applications for grant of EILs have been received in the Office of the Chief Controller of Imports & Exports, a proportionate quota (for different applicants) is worked out of the total quota that has been fixed in respect of each category for the licencing period concerned.

an Essentiality Certificate from a Certifying Authority notified for the purpose. For coal mines, this authority is the Coal Controller and, for other mines, the Indian Bureau of Mines. Under each half-early Import Trade Policy, items permissible for licensing to Actual Users are specified. Also, ceilings are fixed separately for complete units and for spares; and AULs are issued as the applications are received, subject to availability of "ceilings".

45.2. Restricted and banned items may also be licensed as a special case in consultation with the Development Wing, if these are not obtainable from imported stocks or from indigenous manufacturers—*on production* of evidence to that effect.

Delay in issue of Import Licences

46. One of the main causes for complaint from the mining industry is the alleged delay between the submission of an application and the grant of necessary import licence. It has also been pointed out that, in several cases, applications are returned and/or rejected on grounds that indigenous sources should be found even after indigenous sources have been thoroughly investigated and local suppliers' original letters stating their inability to supply the material are sent with applications for import licence.

Import of equipment manufactured indigenously

47.1. There are many items of mine safety equipment for whose manufacture facilities for manufacture exist within the country. In many cases, however, the delivery times are very long. In some cases, the mines could plan sufficiently ahead so that orders are placed in time with indigenous manufacturers but, in an unpredictable industry like mining, it is not easy to plan ahead in many matters of detail. There have also been occasions of the indigenous manufacturers extending the delivery dates considerably. Also, requirement for certain equipment is likely to arise all of a sudden. In such cases, applications for import should be favourably considered and necessary licences issued after minimum delay.

47.2. There are also cases of equipment (such as pumps, fans etc.) where the range of indigenous production is not wide enough to meet the requirements of the mining industry. In such cases, the fact of existence of indigenous manufacture should not be ground for refusing or delaying an application for import licence.

47.3. On certain equipment like mining suspension gear, the life and safety of persons directly depends. Before the use of such equipment of indigenous make is permitted, in mines, it is necessary to ensure that the manufacturing and testing facilities available are adequate and still more vital that proper arrangements are made and followed to keep a check on the continuing quality of production. Till this has been done, *i.e.* till the quality of indigenous manufacture of these items is ensured beyond doubt, their use in mines should be positively discouraged. Cases have come to the notice of the Committee where applications for import of such equipment have been rejected on grounds that indigenous capacity for manufacture exists—where in fact the quality of such manufacture has still to be established to the satisfaction of safety authorities. This has happened perhaps because the authority entrusted with safe working of mines and with the granting of statutory permission to safety equipment (*i.e.* the office of the Chief Inspector of Mines) is not consulted during the processing of applications for such import.

47.4. Much valuable time and energy is apt to be wasted when an application for the import of an item is rejected on the plea that endeavours should be made to obtain the same from indigenous sources when the article is not made in India in the size or type ranges required, or when, in case of items of vital importance, the quality of indigenous goods has not yet been established. It is also necessary that consideration is given not only to the capacity of an indigenous manufacturer to produce a certain item, but also to his ability to deliver the goods in time. Where indigenous manufacturers are heavily overbooked, import licences should not be rejected. As prompt use/replacement of safety equipment is very necessary in the interest of human lives engaged in a very hazardous industry, it would appear necessary for applications for import of mine safety equipment to be given top priority.

Certifying Authority for Mine Safety Equipment

48. The present certifying authorities for mining equipment are, for obvious reasons, not in a position to assess the urgency of the need for particular items of safety equipment and material. Nor are they likely to be fully aware of the quality of indigenous production of such equipment etc. and whether the same is acceptable to the safety authorities. In fact, in certain respects, such as requirements of FLP equipment, they have to collect the necessary information from the Office of the Chief Inspector of Mines. It would thus appear not only logical but also necessary in the interests of safety in mines, that the Office of the Chief Inspector of Mines should be the Certifying Authority for grant of Actual User's licence in respect of Mine *Safety* Equipment. For the sake of clarity, the items coming under this title may be

specified. Appendices A and B may form the basis for drawing up such a list.

Other Difficulties

49.1. Instances have also been pointed out where the import authorities have rejected applications which have been investigated and recommended by the Certifying Authorities. While such cases may be quite few, they are apt to create a rather undesirable impression psychologically.

49.2. Difficulties also arise due to the value of applications being reduced. It is apparent that if the amount allowed in the import licence provides for the import of only part of an equipment or machinery, the import is not of much use to the actual user.

50. A further difficulty is faced by the smaller mines who require only limited quantities of spares and equipment. Considerable time is taken up by these mines having to apply for import of only a few items of equipment; and it could, therefore, be of assistance if the ceilings for EILs could be increased to cover small indents of this nature.

Spare Parts

51.1. Equally if not more important is the case of spare parts. Their vital importance to the maintenance of safe conditions in mines has been explained in Section VI. Spares can at present be obtained only through AULs. By the very nature of the procedure involved, this is a time-consuming process—and in the meanwhile safety (and thereby production too) is likely to suffer.

51.2. The present system of obtaining spares only through AULs is not only unsatisfactory because of the delays involved but, in actual practice, also results in a larger use of foreign exchange. Because it is necessary for each user to have all spares readily available, the same spare is apt to be stocked by a larger number of parties, and thus in much larger quantities, than would be the case if the part concerned were available from open sale. The demand for spare parts is also likely to be inflated. In addition is the likelihood of spares required by one party being stocked by another party which does not actually need it but all the same has to hold on to it.

51.3. After considerable thought, the Committee consider that the best solution for the problem is to permit larger import of spare parts by Established Importers, so that spares are readily available in open sale at proper prices. To minimise malpractices only reliable firms (such as the authorised agents in India of foreign manufacturers) may be given this facility.

51.4. Of course, the first spares which are usually supplied with the new equipment itself should continue to be supplied as hitherto.

Import Trade Policy

52.1. In short, it is vital to the safety and life of persons employed in mines to ensure that the mining industry's requirements for import of safety equipment and material (and particularly of spare parts and replacements) are met *in full*. In particular, separate and liberal import ceilings should be fixed in respect of Mine Safety Equipment and spares, so that safety of men working in one of the most dangerous industries is not jeopardised.

52.2. In respect of safety material and equipment which is not manufactured in India, or in respect of which all the requirements cannot be met from indigenous sources (such as safety explosive wire ropes etc.), adequate quotas should be allowed to Established Importers so that they may be able to supply requirements of mines as and when required, and also carry reasonable stocks of spares.

52.3. There are certain items of mine safety equipment (like exploder batteries, gas-indicator tubes etc.) which have only a limited useful life after the date of manufacture. With the present system of 6-month import licences, actual users have to use up a licence soon after obtaining the same—whether they need the equipment or not, for fear of the licence becoming time-barred. The period of import-licences for such items should be at least one year so that the item can be imported just when required by circumstances.

53. The British Mining Equipment Export Association of 32, Victoria Street, London S.W.I. can be of assistance in connection with import of mine safety equipment from the United Kingdom.

VIII. MINE SAFETY EQUIPMENT ADVISORY BOARD

54. As would be clear from the foregoing, the problem of making available to the mining industry all the equipment and material necessary for its safe working involves a number of diverse factors. On the one hand it is necessary to ensure that in the various schemes for industrial development of the country, due place and priority is given to the manufacture of mine safety

equipment and material. On the other hand it is equally vital that the requirements of the such equipment as are not manufactured within the country, are met speedily and in full through imports.

55. Both these aspects are very closely related, and need to be kept under constant review. The Committee is of the view that this work should be entrusted to a specially constituted standing Mine Safety Equipment Advisory Board. While the exact constitution of this Board may be decided by the Central Government, the Committee considers it necessary for such a Board to have high-level representatives from:

(*i*) The Office of the Chief Inspector of Mines;

(*ii*) The Development Wing;

(*iii*) The Office of the Chief Controller of Imports and Exports;

(*iv*) Mine Owners (Private Sector);

(*v*) Mine Owners (Public Sector);

(*vi*) Mine managers; and

(*vii*) Mine workers.

The Board should function under Chairmanship of the Chief Inspector of Mines, and may have an Officer of his office as Secretary. It may also be given powers to co-opt other members.

56. The Board may be required, in respect of mine safety equipment and material—

(*a*) to make annual assessments of future requirements;

(*b*) to keep track of the progress of indigenous production;

(*c*) to review the position regarding import; and generally to advise on the availability of mine safety equipment.

IX. MISCELLANEOUS

57. Before closing this report, the Committee would like to place on record their great appreciation of the valuable services rendered to the Committee by their Secretary, Shri G. S. Marwaha. The heavy work of collecting all the necessary data, and of drafting the report, fell on him but, despite his other whole-

सत्यमेव जयते

time duties, he performed this work in a very thorough and creditable manner.

(Sd.) G. S. JABBI	*Chairman*
(Sd.) K. S. R. CHARI	*Member*
(Sd.) K. J. WELSH	*Member*
(Sd.) B. H. ENGINEER	*Member*
(Sd.) R. N. SHARMA	*Member*
(Sd.) G. S. MARWAHA	*Secretary*

DHANBAD
The 15*th February*, 1961.

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APPENDIX A

LIST OF SAFETY EQUIPMENT AND MATERIAL (COAL MINES)

	Items of Capital Equipment	*Items of consumable material*
1. Explosives	Approved Exploders	Permitted and Eqs. Explosives.
2. FLP equipment etc.	Motors Switchgear. Transformers. Armoured Cables. Telephonic and Signalling equipment.	Shot-firing Cables. Trailing Cables. Signalling Cables.
3. Winding	Safety Hooks. Distribution plates. Chains, D-Links. Automatic Contrivances. Continuous Speed Recorders. Depth Recorders. Keps.	
4. Haulage	Inter-coupled run-away switches & stop blocks.	Fire-resistant Conveyor belting.
5. Wire Ropes etc. ..	Rope Cappels	Guide Rope. Winding Rope. Haulage Rope. Flexible Rope.
6. Mine Support ..	Prop Withdrawers	Timber. Steel for Mine Support.
7. Pump & Watering ..	Pumps Pipes.	Alkathene Pipes.
8. Lighting etc.	Fixed lamps. Electric Cap Lamps. Flame Safety Lamps.	
9. Ventilation	Mine Fans. Continuous-recording Water Gauges. Continuous Speed Recorders. Anemometers & Hygrometers etc. Gas Analysing Apparatus.	Fire-resistant Brattice. Cloth. Air Ducting. Gas-Indicator tubes (Calorimetric).

सत्यमेव जयते

10. Dust Control, Fire-fighting & Rescue etc.	Self-contained Breathing Apparatus. Resuscitating Apparatus. High Pressure Pumps. Gas masks. Fire-Extinguishers. Fire Pumps (Trolley-mounted) Ball Mills.	Water Hose Pipes Incombustible dust.
11. Protective Equipment	Safety Belts & Accessories.	Hard Hats. Miners' Boots.
12. Medical Equipment ..	Ambulance Vans	First Aid Kits.
13. Surveying equipment	Theodolites. Miners' Dials. Dumpy Levels. Accessories.	

सत्यमेव जयते

APPENDIX B

LIST OF SAFETY EQUIPMENT AND MATERIAL (METALLIFEROUS MINES)

	Item of Capital Equipment	*Item of consumable material*
1. Communications	Telephonic & Signalling Equipment.	—
2. Winding Equipment	Safety Hooks. Distribution plates. Chains, D-Links. Automatic Contrivances. Continuous Speed Recorders. Depth Recorders. Keps.	
3. Haulage Equipment	Inter-coupled run-away switches & stop-blocks.	Fire-resistant Conveyor belting.
4. Wire Ropes etc.	Rope Cappels.	Guide Rope. Winding Rope. Haulage Rope. Flexible Rope.
5. Mine Support	Prop Withdrawers.	Timber. Steel for Mine Support.
6. Pumps	Pumps. Pipes.	—
7. Lighting etc.	Fixed Lamps. Portable lamps. (Carbide, electric cap etc.)	—
8. Ventilation	Mine Fans. Continuous-recording Water Gauges. Continuous Speed Recorders. Anemometers & Hygrometers etc. Gas Analysing Apparatus. Self-contained Breathing Apparatus.	Fire-resistant Brattice Cloth Air Ducting. Gas-indicator tubes (Calorimetric)
9. Fire-fighting & Rescue etc.	Fire Extinguishers. Fire Pumps (trolley-mounted).	—

10. Protective Equipment	Dust Masks; Respirators.	Safety Belts and Accessories. Hard Hats. Miners' Boots. Eye-shields, Gloves, Leg-guards etc.
11. Medical	Ambulance Vans.	First Aid Kits.
12. Surveying Equipment	Theodolites. Miners' Dials. Dumpy levels. Accessories.	

APPENDIX C

SUB-COMMITTEE (OF THE PRODUCTION AND PREPARATION COMMITTEE OF THE COAL COUNCIL OF INDIA) ON THE REQUIREMENTS FOR MINING MACHINERY AND EQUIPMENT DURING THE THIRD FIVE YEAR PLAN

Composition

Chairman

1. Shri B. K. Ghosh	Deputy Coal Controller (Production)

Members

2. Shri S. S. Grewal	Chief Inspector of Mines.
3. Shri B. R. Tooley	Chief of Planning Section, National Coal Development Corporation.
4. Shri H. R. Dewan	Director, Indian Bureau of Mines.
5. Shri K. J. Welsh 6. Shri S. C. Ghosh	Representing Indian Mining Association.
7. Shri S. N. Mullick	Representing Indian Mining Federation.
8. Shri B. C. Shah	Representing Indian Colliery Owners' Association.

Secretary

9. Shri S. S. Garga	Secretary to the Coal Controller.

Terms of Reference

(1) To draw up a complete list of mining machinery and equipment, and to indicate the items which should be fabricated and manufactured in the country;

(2) To examine the existing manufacturing capacity in the country of each of the items of machinery & equipment and to estimate additional annual production capacity required for each item taking into account.—

(*a*) a tentative target of production of 100 million tons in the Third Five Year Plan period;

(*b*) the number of new and fully mechanised mines that may be opened; and

(*c*) the possibility of an increased degree of mechanisation in the existing mines.

APPENDIX D

ASSESSMENT MADE BY COAL COUNCIL SUB-COMMITTEE IN RESPECT OF REQUIREMENTS OF UNDERGROUND MINING MACHINERY AND EQUIPMENT FOR A STANDARD UNIT OF ONE MILLION IN TON ANNUAL PRODUCTION

(*Comprising four Collieries*)

Item	*Number*	*Explanatory notes*
1. **Coal Cutters**		
(*a*) Coal-Cutters FLP ..	30	Allowance has been made for spare coal cutters and gate-end boxes to allow for breakdowns and overhauls.
(*b*) Gate End Boxes ..	45	
2. Loaders	12	The fact that expansion in the public as well as the private sector will demand this item has been taken into account. Adjustments can be made between these sectors for actual requirements.
3. **Conveyors**		
(*a*) Chain Conveyors ..	60	The demand for this will not be great in the private sector.
(*b*) Belt Conveyors ..	22	Allowance has been made for the expected increase in the demand from the private sector and for the new collieries, and also for replacement and mechanisation of old collieries. Belt Conveyors will be required by various other industries also.
4. Locomotives	4	This low figure has been estimated taking into account the use of endless haulages in lieu.
5. **Haulages and Clips**		
(*a*) Endless Haulages ..	8	Allowance has been made for replacement and also for the requirements of new mines.
(*b*) Direct Haulages ..	12	Assumption has been made that coal seems would be of normal gradients and that ordinary 40 cft. coal tubs would be used.
(*c*) Rope clips	16	

Item	*Number*	*Explanatory notes*
6. **Electric Winders, cages winding pulleys and head gear structures.**		
(*a*) Electric Winders	8	The size of the winding engine will depend on the depth of shaft and amount of coal to to be wound.
(*b*) Headgears	8	Assessment made in conformity with the requirements of winding engines.
(*c*) Pulleys	20	
(*d*) Cages	20	
7. Main mine ventilating fans with motors.	5	During the next 3 or 4 years, fans will be required in increasing numbers. The motors to be used with the mine fans should be of synchrnous type for power factor improvement.
8. Booster fans	12	
9. **Pumps**		
(*a*) Main pumps (Large capacity).	12	
(*b*) Dip pumps	16	
(*c*) Face pumps	32	
10. Crushers .. .. .. (for stone dust)	8	Crushers will be required for various uses in addition to crushing material for stowing *e.g.*, crushing coal to size. The old mines may also require some crushers.
11. Ball Mills	10	Assumption has been made that stone dusting will be introduced more and more in mines in the near future.
12. Sand pumps with separators and slushers.	16	A large number of sand pumps is likely to be required during the Third Five Year Plan as extraction of coking coal in the Jharia field will increase and the sand supply schemes of Coal Board will be implemented. (100 set of internal replacement parts should be provided for every 1 m. tons of coal).
13. **Suspension Gear**		
(*a*) Safety hooks ..	22	
(*b*) Suspension chain sets	25	Use of manganese steel for cage suspension gear is recommended.

Item	*Number*	*Explanatory notes*
(*c*) Rope cappels ..	25	
(*d*) Bell Boxes	20	
14. Cage keps (Sets)	8	
15. **Steel props and pit prop withdrawers.**		
(*a*) Steel props	50	
(*b*) Pit Prop Withdrawers	80	
16. **Drills, Drill bits, etc.**		
(*a*) Coal Drills (Electric)	45	
(*b*) Coal drill bits ..	2,000	
(*c*) Drill Rods	100	
17. **Air Compressors & Rock drills.**		
(*a*) Air Compressors ..	8	Will be required for new shafts, quarrying and workshops etc., and also for coal mining where pneumatic picks are used.
(*b*) Compressed air drills (complete with rods & 2 bits per drill).	80	
18. Equipment for preventing over winding and over speeding.	12	
19. **Switchgear F.L.P.**		
(*a*) H.T. switches FLP (oil-immersed).	33	
(*b*) L.T. Switches ELP (oil-immersed).	45	
(*c*) Air break switches FLP.	60	
20. **Transformers, motors**		
(*a*) H.T. Power Transformers.	4	
(*b*) Mining type Transformers.	8	
(*c*) Industrial type Transformers.	8	
(*d*) Drilling transformers FLP.	48	
(*e*) Lighting transformers FLP.	20	
(*f*) Motors	200	75% (or 150) FLP
21. Screens	5	
22. Vibrators	4	

सत्यमेव जयते

Item	*Number*	*Explanatory notes*
23. **Ropes**		
	Feet	
(*a*) Non-spin winding ropes (1", 1-1/8", and 1-1/4").	14,000	
(*b*) Guide ropes ..	35,000	
(*c*) Haulage ropes (½" to 1").	160,000	
(*d*) Flexible ropes ..	200,000	
24. **Safety Lamps**		
(*a*) Electric Cap Lamps	5,000	
(*b*) Oil Lamps	800	
25. **Cables**		
(*a*) PILC DWA Cables ..	60,000	
(*b*) Trailing Cables for coal-cutting machines.	14,000	
(*c*) Trailing cables for drills.	34,000	
26. Rails and Joists	—	Indigenous capacity exists.
27. **Mines Cars, tipplers tub wheels and axles.**		
(*a*) Mine Cars (with tapered roller bearings).	4,000	
(*b*) Coal tubs	1,000	
(*c*) Tub wheels	2,000	
28. **Pipes Fittings**		
	Feet	
M.S. Pipes 8"	2,000	
7"	2,200	
6"	8,000	
5"	7,000	
4"	30,000	
3"	30,000	
2"	20,000	
1"	20,000	
¾"	30,000	
½"	30,000	
29. **Methanometers, Anemometers, Automatic recorders, other meters and gauges.**		
(*a*) Methanometers ..	12	
(*b*) Water Gauges (Automatic recording).	12	
30. Workshop Equipment ..		Assessed separately—list not attached here.
31. Underground lighting units for faces.	600	

Item	*Number*	*Explanatory notes*
32. **Mine Safety Equipment**		
(*a*) Self-contained Breathing Apparatus.	100	
(*b*) Resuscitating Apparatus.	20	
(*c*) High Pressure gas pumps.	5	
(*d*) Hard hats	4,000	
(*e*) Fire-fighting equipment.	50	
(*f*) Hose pipe	6,000 ft.	
(*g*) Gas masks	10	
(*h*) Gas analysis apparatus	2	
33. **Underground Bells and Telephones.**		
(Signalling equipments).		
(*a*) Telephone cables ..	4,000 ft.	
(*b*) Signalling Bells (Intrinsically safe)..	100	
(*c*) Telephones (Intrinsically safe).	100	
(*d*) Shaft signalling equipments.	10 sets	
34. **Survey Instruments**		
(*a*) Miners' dials ..	8	
(*b*) Theodolites	8	
(*c*) Dumpy levels ..	5	
35. **Shot-firing apparatus. (approved type).**		
(*a*) Single-shot	20	
(*b*) Multi-shot	20	
36. Spare parts	15	% on tonnage basis.
37. Weight-bridges	4	

सत्यमेव जयते

APPENDIX E

ASSESSMENT MADE BY COAL COUNCIL SUB-COMMITTEE IN RESPECT OF REQUIREMENTS OF OPEN CAST MINING MACHINERY AND EQUIPMENT FOR A STANDARD UNIT OF 2·5 TO 3 MILLION TONS ANNUAL PRODUCTION.

Item	*Numbers*
1. 25 cyd. Dragline	1
2. 15 cyd. Dragline	1
3. 6/8 cyd. Shovel	5
4. 4 cyd. Shovel	3
5. Dumper Shovel	60
6. Dumpers	21
7. Crawler tractor dozers	15
8. Wheel type dozers	6
9. Rotary blast hole drills	9
10. Rotary coal drills	6
11. Motor graders	3
12. Road rollers	3
13. 40 ton bottom dumpers	28
14. Towing units for item 13 above	12
15. 30/40 ton cranes	3
16. 5 ton wrecker cranes	3
17. Pneumatic jack-hammers and picks	30
18. Scrapers with towing units	6
19. Low-bed trailers	3
20. 250/300 cft. compressors (portable)	6
21. Jeeps	9
22. Pick-ups	6
23. 5 ton Trucks	12
24. Pumps (1000 ghm capacity, with 200 ft. and 400 ft. heads)	12
25. Flexible non-spin galvanised rope (¾″ to 1¼″ diam.)	4,00,000 ft.
26. Spares for the II and III Plan machinery including shovel and dragline teeth.	25% by weight.

सत्यमेव जयते

APPENDIX F

APPROXIMATE PRICE AND LIFE OF SOME ITEMS OF SAFETY EQUIPMENT AND MATERIAL

Explosives etc.	*Approximate price*	*Approximate life*
High explosives	Rs. 1·60 to Rs. 1·75 per lb.	
Detonators	Rs. 450 to Rs. 475 per 1,000.	
Exploders	Rs. 250 for single shot Rs. 725 for six-shot A 6-shot exploder battery costs about Rs. 100 when brought out by sea.	
Cables		
Armoured cable	Rs. 6 per ft. (for 0·04" size).	7 years
Trailing cable (coal-cutting machine).	Rs. 15-16 per ft.	2 years
Trailing cable (drills)	Rs. 5 per ft.	2 years
Shotfiring cable		5-7 years
Communications		
Telephones	Rs. 600 per telephone	3 years
Bells	Rs. 200 each. A bell transformer costs about Rs. 400.	
Winding Equipment		
Suspension gear	About Rs. 3,000 per cage	10 years (Statutory)
Automatic Contrivance	Rs. 80,000.	
Conveyors		
PVC belting	About Rs. 26 per ft. (for 26" wide belt).	18 months
Belt joints	About Rs. 54 per box	
Ropes		
Guide Rope	From Rs. 2·36 per ft. (for 1" size) to Rs. 3·04 per ft. (for 1¼" size).	5 years
Winding Rope	From Rs. 3·03 per ft. (for 1" size) to Rs. 4·35 per ft. (for 1¼" size)	3½ years (Statutory).
Haulage Rope	From Rs. 0·91 per ft. (for 5/8" size) Rs. 1·08 per ft. (for ¾" size) to Rs. 1·59 per ft. (for 7/8" size).	

Explosives etc.	*Approximate price*	*Approximate life*
Flexible Rope ..	From Rs. 0·70 per ft. (for ½" size) Rs. 1·11 per ft. (for 5/8" size) to Rs. 1·44 per ft. (for ¾" size).	
Safety Lamps		
Elec. Cap Lamp ..	Rs. 155—160 each	Head piece : 5 years Cables and Batteries-18 months Bulbs: 3 months
Flame Safety Lamp ..	Rs. 70—75 each	
Flame Safety Lamp gauges. ..		1 year
Flame Safety Lamp glasses—		2 years (on the average).
Ventilation Equipment		
Flexible air duct ..	Rs. 8 per ft.	
Brattice cloth	Rs. 105 per 100 yds.	
Anemometer	Rs. 700 each	
Whirling hygrometer ..	Rs. 200 each	
Dust and Fire-fighting Equipment		
Incombustible dust ..	Rs. 80—100 per ton	
Fire Extinguisher ..	Rs. 400 each	
Alkathene pipe ..	Rs. 2·17 per metre (¾" size).	2 years
Protective Equipment		
Safety Belt		5 years in underground mines, 2 years in opencast mines.
Hard Hat	Rs. 12—15 each	5 years
Miners' Boot	Rs. 18—25 each	1 year
Medical		
Ambulance Vans ..	—	10 years
Station First Aid Kit ..	—	4 years
Officials' FA Kit ..	Rs. 30—36	2 years

APPENDIX G

REQUIREMENTS OF MINE SAFETY EQUIPMENT & MATERIAL FOR A UNIT OF ONE MILLION TON ANNUAL COAL OUTPUT (UNDERGROUND WORKINGS)

	Capital equipment		Consumable Material	
1. *Permitted Explosives etc.*	Exploders : Single-shot	20	Permitted explosives	50 tons
	Multi-shot	20	Eqc. explosives	60 tons
			Electric Detonators (all types)	0·5 million
			Shotfiring cable	50,000 metres
Substitutes			Multi-shot Exploder batteries	60
2. *FLP Equipment*	FLP Motors (of different h.p.)	150	Cables: Armoured	45,000 ft.
	Gate-end boxes	40	Trailing (for c.c. machines)	10,000 ft.
			Trailing (for drills)	30,000 ft.
			Telephone	4,000 ft.
	Switchgear: H.T.Oil-immersed	33		
	L.T.Oil-immersed	45		
	Air break	60		
	Transformers : Mining type (Power)	8		
	Drill type	40		
	Lighting	20		
	FLP Lighting fittings	400		
	Telephones (Intrinsically safe)	60		
	Shaft signalling equipment	8		
	Signal bells (Intrinsically safe) with transformer	50		
	Cable vulcanisers	4		

	Capital equipment		Consumable Material	
3. *Winding Equipment* ..	Safety Hooks Distribution plates D-Links etc.	10 sets (for two cages each)		
	Chains (about 1" diam.)	1,000 ft.		
	Keps	10		
	Automatic Contrivances	10		
	Depth Recorders	10		
	Continuous Speed Recorders (including for fans).	15		
4. *Haulage equipment* ..	Haulage clips	32	Fire-resistant Conveyor belting	50,000 ft.
	Inter-coupled runaway Switches and stop blocks.	12		
5. *Wire Ropes etc.* ..	Winding Rope Cappels	20	Guide Ropes	35,000 ft.
	Haulage Rope Cappels	20	Winding Ropes	14,000 ft.
			Haulage Ropes	160,000 ft.
			Flexible Ropes	200,000 ft.
6. *Mine Support*	Prop Withdrawers	40		7,500 tons
				50 tons
7. *Pumps & Watering* ..	Pumps: Main	12	Alkathene Pipes	20,000 ft.
	Dip	16		
	Face	32		
	Pipes: 5"—8"	20,000 ft.		
	2"—4"	70,000 ft.		
	½"—1"	60,000 ft.		
8. *Lighting*	For FLP light fittings	See item 2	Cap Lamp Batteries	3,000
	Electric Cap lamps	5,000	Cap Lamp Bulbs	20,000
	Oil Safety lamps	800	Safety Lamp gauzes	800
			Safety Lamp glasses	400

9. *Ventilation*	Main Fans	5	Fire-retarding Brattice Cloth	10,000 yds.
	Booster Fans	5	Flexible air ducting	5,000 yds.
	Face Fans	25	Gas-indicator tubes	Emergency equipment requirement cannot be estimated.
	Continuous Recording Water Gauges	12		
	Methanometers	12		
	Gas analysis apparatus	5		
	Anemometers	12		
	Hygrometers	12		
10. *Dust Control, Fire-fighting and Rescue Equipment*	Ball Mills	4	Incombustible dust	2,000 tons
	Fire extinguishers (of different types).	100	Fire-Hose	6,000 ft.
	Self-contained fire pumps	5		
	Breathing apparatus	12		
	Resuscitating apparatus	5		
	High-Pressure Gas pumps	1		
11. *Protective equipment* ..	Safety Belts & Accessories	15	Hard Hats	5,000
			Miners' Boots	5,000
12. *Medical*	Ambulance Vans		Station First Aid Kits	100
			Officials' First Aid Kits	250
13. *Surveying*	Theodolites	5	Plus other surveying and plotting equipment	
	Miners' Dials	10		
	Dumpy Levels	5		

APPENDIX H

REQUIREMENTS OF MINE SAFETY EQUIPMENT AND MATERIAL FOR UNIT OF ONE MILLION TON ANNUAL COAL OUTPUT (OPENCAST WORKINGS)

	Capital equipment		Consumable Material	
1. *Wire Ropes etc.*			Haulage Ropes	20,000 ft.
			Flexible Ropes	20,000 ft.
2. *Fire-fighting etc.*	Fire extinguishers	25	Hose Pipe	1,000 ft.
	Fire Pumps etc.	2		
3. *Protective Equipment* ..			Safety Belts	50
			Manilla ropes	5,000 ft.
			Hard Hats	500
			Miners' Boots	500
4. *Medical*	Ambulance Van	1	Station First Aid Kits	20
			Officials' First Aid Kits	150
5. *Surveying*	Theodolites	1		
	Dials	4		
	Dumpy Levels	2		

APPENDIX I

ESTIMATED ANNUAL REQUIREMENTS OF COAL MINES FOR SAFETY EQUIPMENT AND MATERIAL (1961 and 1965)

	1961			1965			Remarks
	For new mines opened during the year	For old mines	Total	For new mines opened during the year	For old mines	Total	
1	2	3	4	5	6	7	8
1. *Permitted Explosives etc. (in respect of gassy mines only)*:							
Permitted explosives (tons)	—	—	900	—	—	1,700*	
Sq. S. explosives (tons)	—	—	1,080	—	—	2,040*	
Elec. Detonators (millions)	—	—	90	—	—	170	
Shotfiring Cable (million metres) ..	—	—	9	—	—	17	
Approved Exploders :							
Single-shot	—	—	80	—	—	80	
Multi-shot	—	—	80	—	—	80	
Multi-shot Exploder batteries ..			1,080			2,040@	

---

*In addition, about 3,500 tons (in 1961, rising to 4,300 tons in 1966) of non-permitted high explosives would be required for non-gassy mines (excluding the requirements of open-cast mines) plus detonators and shot-firing cable for the same.

@The actual demand may be smaller, due to the expected use of continental type (battery-less) multi-shot exploders.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
2. *FLP Equipment* (*for gassy mines only, except where otherwise stated*)							
FLP motors	—	—	600	—	—	600	
Gate end boxes	—	—	160	—	—	160	
Switchgear :							
H.T. Oil immersed	—	—	132	—	—	132	
L.T.Oil immersed	—	—	180		—	180	
Air break type	—	—	240	—	—	240	
Transformers :							
Mining type	—	—	32	—	—	32	
Drill type	—	—	160	—	—	160	
Lighting	—	—	80	—	—	180	
FLP light fittings	—	—	1,600	—	—	1,600	
Telephones (Intrinsically safe; as well as ordinary mining type for use in non-gassy mines)	360	240	600	360	1,440	1,800	
Shaft Signalling equipment (Sets) ..	48	20	68	48	68	116	Assuming 5 yr. life.
Signalling Bells (Intrinsically safe, as well as ordinary mining type for use in non-gassy mines)	300	120	420	300	420	720	Assuming 5 yr. life.
Cable (*in* 1000 *ft*.: (for all underground mines)							
Armoered	270	260	530	270	390	660	
Trailing (C.C. Machines)	60	200	260	60	580	640	
Trailing (drills)	180	600	780	180	1,740	1,920	
Telephone	24	24	48	24	36	60	
Cable vulcanisers			24			24	
3. *Winding equipment* :							
Winding Rope Cappels	120	90*	210	120	120	240	*At present there are about 560

Safety Hooks	120	90	210	120	120	240	shafts deeper than 45 metres in coal mines.
Distribution Plates	120	90	210	120	120	240	
Chains (1,000 ft.)	6	4·5	10·5	6	6	12	
Keps (sets)	60	45	105	60	60	120	
Automatic Contrivances	60	45**	105	60	60	120	**At present there are 100 shafts deeper than 150 metres. Many of these are still to be fitted with automatic contrivances.
Depth Recorders	60	45	105	60	60	120	
Continuous Speed Recorders (including for fans) ..	90	70	160	90	90	180	
4. *Haulage equipment* :							
Haulage rope cappels	170	180	350	170	270	440	Made locally.
Haulage clips	216	216	532	216	532	748	
Intercoupled Run-away Switches & Stop blocks	—	—	90	—	—	90	
Fire-resistant Conveyer belting (1000 ft.)	200	75@	325	200	300	500	Assuming that only 2/3 of the additional underground output would be conveyed.
5. *Wire Ropes* :							
Guide Rope (1000 ft.)	210	210	420	210	420	630	
Winding Rope (1000 ft)	84	126	210	84	252	336	
Haulage Rope (million ft.)	0·97	6·88	7·85	0·97	11·20	12·17	
Flexible Rope (million ft.)	1·2	2·2	3·4	1·2	7·0	8·2	
5A. Manila Rope (1000 ft.)	15	25	40	15	100	115	

@About 60,000 ft. of belt conveyors are in use at present.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
6. *Mine Supports* :							
Prop Withdrawers	240	—	240	240	—	240	
Timber (1000 tons)	—	—	345	—	—	500	
Steel Supports (tons)	—	—	50	—	—	500	
7. *Pumps etc.*							
Main Pumps	72	28,	100	72	42	116	
Dip Pumps	96	48	144	96	96	192	
Face Pumps	192	96	288	192	192	384	
Pipes 5″—8″ (1000 ft.)	120	60	180	120	120	240	
2″—4″ (1000 ft)	420	210	630	420	420	840	
½″—1″ (1000 ft.)	360	180	540	360	360	720	
Alkathene Pipes (1000 ft.)	120	400	520	120	600	720	
8. *Lighting* :							
Elec. Cap Lamps (1000's)	30	50*	80	30	80	110	*Including 30,000 every year for supply to existing non-gassy mines.
Cap Lamp batteries (1000's)	—	—	70	—	—	250	
Cap Lamp bulbs (1000's)	—	—	480	—	—	1,700	
Lamp Gauzes (1000's)	—	—	30	—	—	50	
Lamp Glasses (1000's)	—	—	15	—	—	25	
Oil Safety Lamp (1000's)	4·8		4·8	4·8	—	4·8	
9. *Ventilation* :							
Main Fans	—	—	30	—	—	30	
Booster Fans	—	—	30	—	—	30	
Face Fans	—	—	150	—	—	150	
Flexible air ducting (1000 yds.) ..	30	60	90	30	180	210	
Fire-resistant Brattice cloth (1000 yds.)	60	260	320	60	480	540	

Continuous recording							
Water gauges	—	—	72	—	—	72	
Methanometers	72	28	100	72	100	172	
Gas Analysis Apparatus	—	—	30	—	—	30	
Anemometers	—	—	72	—	—	72	
Hygrometers	—	—	72	—	—	72	
Gas-indicator tubes (Emergency equipment requirements cannot be estimated)							
10. *Dust Control, Fire-fighting and Rescue equipment* :							
Fire Extinguishers	—	—	750	—	—	750	
Fire Pumps	—	—	35	—	—	35	
Hose Pipes (1000 ft.)	36	36	72	36	72	108	Assuming 5 yr. life
Self-contained breathing Apparatus	—	—	72	—	—	72	
Resuscitating Apparatus	—	—	30	—	—	30	
High Pressure Pumps	—	—	6	—	—	6	
Incombustible dust (1000 tons) ..	—	—	36	—	—	84	
11. *Protective Equipment* :							
Safety Belts etc.	240	360	600	240	1,160	1,400	**Including 30,000 every year for supply to existing mines.
Hard Hats (1000's)	32	48**	80	32	80	112	
Miners' Boots (1000's)	32	200	232	32	350	382	
12. *Medical*							
Ambulance Vans	10	5	15	10	8	18	Assuming 10 year life.
Station FA Kits	700	990	1,690	700	1,700	2,400	Assuming 4 year life.
Officials' FA Kits (1000's)	3·6	9·9	13·5	3·6	17·0	20·6	Assuming 2 year life.
13. *Surveying* :							
Theodolites	33	17	50	33	17	50	
Miners' Dials	66	34	100	66	34	100	
Dumpy Levels	33	17	50	33	17	50	

APPENDIX-J

COPY OF LETTER NO. I & M-25(1)/61, DATED 17th JANUARY 1961 FROM DIRECTOR (MINERAL), PLANNING COMMISSION

I am directed to refer to your letter No. 1060-62, dated the 9th January 1961 asking for information on the estimated production during 1960 and the target for 1965 in respect of every mineral including coal and petroleum and to say as follows :

Except in the case of coal, lignite and iron ore, targets have not been worked out in respect of other minerals. In regard to petroleum products, on the basis of the discussions in the Working Group on Fuel, an estimate has been made of the demand for the major petroleum products which could be met by 1965-66. In addition the Plan envisages the establishment of a copper smelting plant in the public sector for the production of 10,000 tons of electrolytic copper. The assessment of the mineral raw material requirements for the programme of industrial development envisaged in the Third Plan could not be taken up so far. This work is expected to be done before the plan is finalised, and the information furnished to you as soon it is ready. At the moment therefore we are in a position to furnish only the following information.

	Estimated production in 1960	Target for 1965-66
Coal	50 to 51 mil. tons	97 mil. tons.
Iron Ore	About 11 mil. tons	32 mil. tons
Crude petroleum	About 0·4 mil. tons	3 mil. tons.
Lignite	0·4 mil. tons	5·5 mil. tons
Manganese Ore	About 1·8 mil. tons	—
Ilmenite	0·3 mil. tons	—
Limestone	1·2 mil. tons	—
Copper Ore	0·5 mil. tons	—

APPENDIX K

REQUIREMENTS OF MINE SAFETY EQUIPMENT AND MATERIAL FOR A UNIT PRODUCING 1 MILLION TONS OF MINERAL ORE ANNUALLY FROM OPENCAST WORKINGS

(*Based on assumption that the large units would be very highly mechanised while the smaller units would be worked manually*)

	Capital Equipment		Consumable Material	
1. Wire Ropes etc. ..	—		Haulage Rope	20,000 ft.
			Flexible Rope	20,000 ft.
2. Fire-fighting etc. ..	Fire extinguisher	25		
	Fire Pumps etc.	2		
3. Protective Equipment	—		Safety Belts	50
			Manila Rope	5,000 ft.
			Hard Hats	500
			Miners' Boots	500
4. Medical	Ambulance Vans	1	Station First Aid Kits	20
			Officials' First Aid Kits	150
5. Surveying	Theodolites	1		
	Dials	4		
	Dumpy Levels	2		

APPENDIX L

ESTIMATED ANNUAL REQUIREMENTS OF METALLIFEROUS MINES FOR SAFETY EQUIPMENT AND MATERIAL

(1961 and 1965)

(*Items* 1, 2, 5, 6, 7 *and* 8 *are mainly for underground mines*)

	1961			1965			
	For new mines opened during the year	For old mines	Total	For new mines opened during the year	For old mines	Total	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1. *Communications* :							
Telephones (Mining type)	30	30	60	30	70	100	
Shaft signalling equipment (sets) ..	4	4	8	4	6	10	
Telephone Cables (1000 ft.)	2	2	4	2	2	4	
2. *Winding Equipment* :							
Winding Rope Cappels	5	30*	35	5	40	45	
Safety Hooks	5	30	35	5	40	45	
Distribution Plates	5	30	35	5	40	45	
Chains (1000 ft.)	0·5	3·0	3·5	0·5	4·0	4·5	
Keps (sets)	3	12	15	3	17	30	
Automatic Contrivances	3	3**	6	3	5	8	
Depth Recorders	3	3	6	3	5	8	
Continuous Speed Recorders ..	3	3	6	3	5	8	
3. *Haulage Equipment* :							
Haulage Rope Cappels	75	50	125	75	75	150	
Haulage Clips	80	60	140	80	80	160	
Intercoupled Runaway Switches and Stop blocks	50	—	50	50	—	50	

Wire Ropes etc. :							
@Guide Ropes (1000 ft.)	17	23	50	17	33	60	
Winding Ropes (1000 ft.)	7	43	50	7	53	60	
Haulage Rope (1000 ft.)	240	480	720	240	960	1,200	
Flexible Rope (1000 ft.)	200	400	600	200	800	1,000	
4A. Manilla Rope (1000 ft.)	40	40	80	40	80	120	
5. *Mine Support* :							
Prop Withdrawers	20	—	20	20	—	20	
Timber (1000 tons)	—	—	50	—	—	60	
Steel Supports (tons)	25	75	100	25	125	150	
6. *Pumps etc.* :							
Main Pumps	6	6	12	6	9	15	
Dip Pumps	8	8	16	8	12	20	
Face Pumps	12	12	24	12	18	30	
Pipes 5″—8″ (1000 ft.)	10	5	15	10	15	25	
2″—4″ (1000 ft.)	35	15	50	35	20	55	
½″—1″ (1000 ft.)	30	15	45	30	20	50	
Alkathene Pipes (1000 ft.)	5	2	7	5	3	8	
7. *Lighting* :							
Carbide Cap Lamps (1000's)	2	3*	5	2	8*	10	
8. *Ventilation* :							
Main Fans	3	7*	10	3	7	10	*Includes provision for fitting more fans in existing mines.
Face Fans	12	18	30	12	18	30	
Flexible Air Duct (1000 yd.)	3	17	20	3	27	30	
Water gauges	6	14	20	6	14	20	
Gas analysing apparatus	2	2	4	2	2	4	
Anemometer	6	6	12	6	6	12	
Hygrometer	6	6	12	6	6	12	

---

* At present there are 180 vertical shafts (deeper than 45 metres), fitted with winding engines in the metalliferous mines.

** At present there are 35 shafts deeper than 150 metres.

@Mostly rigid guides are used.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
9. *Fire fighting and Rescue etc.* :							
Fire extinguishers	—	—	250	—	—	250	
Fire Pumps	—	—	20	—	—	20	
Hose Pipes (1000 ft.)	10	10	20	10	15	25	
10. *Protective equipment* :							
Safety Belts etc.	400	1,600	2,000	400	2,400	2,800	*Includes provision for supply to miners' in existing mines.
Hard Hats (1000's)	6	9*	15	6	14*	20	
Miners' Boots (1000's)	6	9*	15	6	14*	20	
11. *Medical* :							
Ambulance Vans	—	—	9	—	—	9	
Station FA Kits	200	800	1,000	200	1,000	1,200	
Officials' FA Kits (1000's)	1·5	4·5	6·0	1·5	7·5	9·0	
12. *Surveying* :							
Theodolites	10	5	15	10	5	15	
Dials	40	20	60	40	20	60	
Dumpy Levels..	20	10	30	20	10	30	

APPENDIX-M

TOTAL ESTIMATED ANNUAL REQUIREMENTS FOR MINE SAFETY EQUIPMENT AND MATERIAL (1961 to1965)

(All figures have been rounded off)

	In 1961	rising to	In 1965	Remarks
1. *Permitted Explosives etc.* (for gassy mines only)				
Permitted Explosives (tons) ..	900	—	@ 1,700	
EqS Explosives (tons)	1,100	—	@ 2,050	
Electric (copper) Detonators (Millions)	90	—	170	
Shot-firing Cable (m. metres)	9	—	17	
Approved Exploders				
Single shot ..	80	—	80	
Multi shot ..	80	—	80	
Exploder battereis	1,100	—	2,050	
2. *FLP Equipment* (for gassy mines only, except where otherwise indicated)				
FLP motors ..	600	—	600	
Gate-end boxes	160	—	160	
Switchgear : H. T. Oil immersed ..	140	—	140	
L.T.Oil immersed	180	—	180	
Air Bred type ..	240	—	240	
Transformers: Mining type ..	50	—	50	Suitably adjusted for non-gassy mines.
Drill type ..	250	—	250	
Lighting	125	—	125	
FLP light fittings	2,500	—	2,500	Do
Telephones ..	650	—	1,900	Do.
Shaft signalling equipment ..	75	—	115	Do.
Signalling bells ..	425	—	725	
Cables (1000 ft.)				
Armoured ..	530	—	660	Do.

@An estimate of additonal requirements of other mines is given below:

	tons	tons
High explosives for opencast mines ..	3,600	9,600
High explosive for underground mines ..	4,000	5,000

Plus necessary detonators and cables etc.

	In 1961	rising to	In 1965	
Trailing (c. c. machines)	260	—	640	
Trailing (drills)	800	—	1,900	
Telephone ..	50	—	65	Suitably adjusted for non-gassy mines.
Cable vulcanisers	25	—	25	Do.
3. *Winding Equipment*				
Wing Rope cappels	250	—	300	
Safety Hooks ..	250	—	300	
Distribution Plates	250	—	300	
Chains (1000 ft.)	14	—	16·5	
Keps (sets) ..	120	—	150	
Automatic Contrivances	110	—	130	
Depth Recorders	110	—	130	
Continuous speed Recorders (including for fans)	166	—	190	
4. *Haulage Equipment*				
Haulage Rope Cappels	475	—	600	
Haulage Clips ..	675	—	900	
Intercoupled Runaway Switches & Stopblocks ..	140	—	140	
Fire-resistant Conveyor belting (1000 ft.)	400	—	600	Suitably adjusted for opencast mines.
5. *Wire Ropes etc.*				
Guide Rope (1000 ft.)	470	—	700	
Winding Rope (1000 ft.) ..	260	—	400	
Haulage Rope (mill. ft.)	8·5	—	13·25	
Flexible Rope (mill. ft.) ..	4·0	—	9·25	
5A. Manila Rope (1000 ft.) ..	80	—	235	
6. *Mine Support*				
Prop withdrawers	260	—	260	
Timber (1000 tons)	400	—	560	
Steel for Support (tons)	150	—	650	
7. *Pumps etc.*				
Main Pumps ..	110	—	115	
Dip Pumps ..	150	—	200	

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	In 1961	rising to	In 1965
Fire pumps ..	300	—	400
Pipes 5"-8" (1000ft.)	200	..	265
2"-4" (1000 ft.)..	680	—	900
½"-1" 1000 ft.)	500	—	800
Alkathene pipes (1000 ft.) ..	525	—	725
8. *Lighting* ..			
Elec. Cap Lamps (1000's)	85	—	120
Cap Lamp batteries (1000's) ..	70	—	275
Cap Lamp Bulbs (millions) ..	0·5	—	1·8
Oil Safety Lamps (1000's) ..	5	..	5
Safety Lamp Gauzes (1000's) ..	30	—	50
Safety Lamp Glasses (1000's) ..	15	—	25
9. *Ventilation*			
Main Fans ..	40	..	40
Booster Fans	30	..	30
Face Fans ..	180	..	240
Flexible air-ducting (1000 ft.) ..	110	—	180
Fire-retarding brattice cloth (1000 yds.)	320	—	540
Continuous recording water gauges	95	—	95
Methanometers ..	100	—	172
Gas analysing apparatus ..	35	..	35
Anemometers ..	75	..	75
Hygrometers ..	75	..	75
Gas-indicator tubes	Emergency equipment—requirement cannot be estimated		
10. *Dust Control, Fire Fighting and Rescue Equipment*			
Fire Extinguishers	950	..	950
Fire Pumps ..	50	..	50
Hose Pipe (1000 ft.)	95	—	120
Self contained breathing app.	75	..	75
Resuscitating apparatus ..	30	—	30
High Pressure Pumps ..	6	—	6
Incombustible Dust (1000 tons)	36	—	84

	In 1961	rising to	In 1965
11. *Protective Equipment*			
Safety Belts ..	2,600	—	4,200
Hard Hats (1000's)	95	—	125
Miners' Boots (1000's) ..	250	—	400
12. *Medical*			
Ambulance Vans	25	..	25
Station FA Kits (1000's) ..	2·6	—	3·5
Official's FA Kits (1000's) ..	20	—	30
13. *Surveying*			
Theodoliter ..	65	..	65
Miner's Dials ..	160	..	160
Dumpy Levels ..	80	..	80

APPENDIX N-A

LIST OF ITEMS STILL IMPORTED [BY OLDHAM & SONS (INDIA) PRIVATE LTD]

FOR THE MANUFACTURE OF ELECTRIC SAFETY LAMPS IN INDIA

Item	Qty. required for a set of 100 lamps	Remarks
Section: 1		
Miners' Cap lamp with battery: Headpiece Mouldings ..	100 'C'	Also correct grade moulding powder not available in India.
Lens+Rings	100 'C'	
Lock Barrels	100 'C'	
Lock Contracts	100 'C' & 'D'	
Switch Knobs	100 'A'	
Switch Blades with 3/16" Screws	100 'B'	
Switch Knob Washers ..	100 'A'	
Large Bulb Socket Assemblies	100 'A'	
Lock Barrel Wedges	100 'B'	
Headpiece glasses	100	Glass of a special armoured type. Not available in India. (B).
Large Bulb Switch Connections, with conical spring & washer	100 'B'	
Large Bulbs 4 volts	100	These are bulbs filled with krypton gas and are of a type not manufactured in India. (B).
Reflectors	100	Efforts at indigenous manufature are afoot but no successful sample has yet been manufactured as yet. 'A'.
Lock Springs	100	Indigenous potential suppliers have shown a disinterest in the manufacture in view of the small size and value of the item. 'B'.
Large Bulb Socket Screws	200 'A'	
Spring Washers	100 'B'	
Containers with filler plug and gaskets	100	Repeated attempts to have these manufactured in India have borne no fruit so far. Effort still continuing. 'A'
Battery Sealing Compound	2 lbs. 'B'	
Battery Terminal Compound	2 lbs. 'B'	
Separators (Compressed) ..	400 'B'	Balsa wood not available in India to our specification.
Vent Tubes	200 'C'	
Section: 2		
Static Charger Parts		

सत्यमेव जयते

(1)	(2)	(3)
Section: 3		
Charging Frame Parts		
2BA Single Coil Spring Washers	400 'B'	
Section : 4		
Tools and Testing Equipment		
Keys for lens lock	2 'B' & 'D'	
Keys for slotted screws ..	2 'C'	
Photometer	1 'B'	
Hydrometers	2 'B'	Special beads required not available in India.
Special Key for cable glands	2 'B'& 'D'	
Torque Tester	1 'B'	
Topping up syringes	1 'C'	
Hand tool for applying metal gromets	1 'B'	
'A'	Efforts being made to have the items manufactured indigenously but no successful sample has been produced so far.	
'B'	Not available/manufactured in India. Have therefore to be imported by Actual Users.	
'C'	Indigenous manufacture has been commenced but the progress has been very slow due to production difficulties and the actual production so insignificant that imports have still to be made in these items.	
'D'	These have been earmarked for indigenous production in the near future.	

APPENDIX N—B

ESTIMATED PRODUCTION OF SPARES FOR ELECTRIC SAFETY LAMPS [OF OLDHAM AND SON (INDIA) PRIVATE LIMITED]

Item	*Estimated Production for* 1960-61
Headpiece moulding	—
Lens Rings	—
Cable Outlet glands	1,500
Lock Pins	40,000
Large Bulb Socket Blocks	3,000
Headpiece gaskets Channel type	12,000
Switch Connections	6,000
Cap Hooks	3,000
Securing Screws	12,000
Cables complete	30,000
Terminal clamps with screws	60,000
Clips for fuse connections	12,000
Fuses	96,000
Clips for fuse and clamps	15,000
Cable glands	48,000
Cable locks	12,000
Compound cups	48,000
Belt loops	3,000
Lock Clamp & bush assemblies	9,000
Filler Plug gaskets	60,000
Screws for locking plates	30,000
Battery Insulators	48,000
Battery Covers partly assembled	6,000
Positive Groups	100,000
Negative Groups	100,000
Glass Separators	200,000
Cell Lids	100,000
Gasket Drains	100,000
Indicator lights with bulbs	600
Keys with nuts and washers	3,000
Clip Assemblies	1,500
Charge Indicator meters	3,000
Mining Accumulators	50,000

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APPENDIX N-C

QTY. OF SPARE PARTS ACTUALLY MANUFACTURED ANNUALLY SINCE START OF PLAN

[BY OLDHAM AND SON (INDIA) PRIVATE LIMITED]

Item	1954-55	1955-56	1956-57	1957-58	1958-59	1959-60
Headpiece Moulding	—	—	—	—	—	527
Lens Rings	—	—	—	—	—	3,107
Cable Outlet Glands	125	18	264	491	785	750
Lock Pins	268	425	1,604	3,627	2,894	22,541
Large Bulb Socket Block	58	24	315	339	60	685
Headpiece Gaskets	—	—	—	—	—	—
Channel type	369	768	1,665	4,714	1,311	6,179
Switch Connections	149	12	235	711	824	3,249
Cap Hooks	20	39	85	90	342	864
Securing Screws	58	193	385	1,080	775	6,862
Cables complete	172	69	498	2,658	4,403	12,491
Terminal clamps with screws	544	986	1,618	6,853	10,566	29,234
Clips for fuse connections	144	36	1,339	1,268	1,233	6,443
Fuses	1,392	3,502	7,219	20,155	35,097	51,981
Clip for fuse and clamp	128	380	2,208	1,384	4,400	9,859
Cable Glands	323	307	2,502	6,498	9,862	24,244
Cable Locks	68	61	463	857	577	5,208
Compound Cups	118	122	1,019	2,563	3,363	19,118
Belt Loops	185	16	175	137	432	461
Lock Clamp & Bush assemblies	29	40	286	350	941	5,015
Filler Plug Gaskets	185	2,802	3,573	3,018	14,765	30,880
Screws for Locking Plate	124	204	1,290	5,125	3,260	16,432

Battery Insulators	236	946	2,959	3,771	11,372	27,568
Intercell Connections	610	2,100	2,554	5,318	11,776	50,248
Bettery Covers partly assembled	32	3	87	261	154	4,088
Positive Groups	—	—	—	—	—	50,248
Negative Groups	610	2,100	2,554	5,318	11,776	50,248
Glass Separators	1,220	4,200	5,108	10,636	23,552	100,496
Plastic Trays	610	2,100	2,554	5,318	11,776	50,248
Cell Lids with Gasket Drains	610	2,100	2,554	5,318	11,776	50,248
Static Charger Parts						
Indicator Light Bulbs	42	12	70	—	11	178
Charging Frame Parts						
Keys with Nuts & Washers	4	22	246	196	1,391	1,932
Clip Assemblies	4	12	112	207	155	263
Charge Indicator Meters	30	67	74	229	697	984

APPENDIX O-A

SUMMARY OF SOME REQUIREMENTS FOR FIRE-PROOFED BRATTICE CLOTH

(A summary of requirements from the existing British and American specifications)

1.1. *Specification for cloths* : The weights of jute fabric constructions used vary but an average weight is of the order of 10 oz/lineal yard 40″ wide.

1.2. *Specification for Brattice Cloth:* Plain weave, grey light 13 oz/sq. 11 porter double warp and14 threads per inch, single weft. Width requirements are mainly 72″, 48 ″ and 36″, most purchases being made in widths of 72″.

2.1. *Fireproofing requirements:*

(*a*) According to most specifications, a fire-proofing treatment is satisfactory when it provides no after-flaming, less than 4 secs. after-glow, and char length of less than 4-5 inches by the vertical Bunsen burner test (A.S. T.M.D-626-55T).

(*b*) The amended U.S. Navy specification for heavy military fabrics called for as after-flaming of not more than 3 secs. an after-glow of not more than 180 secs. and char length of 4 inches maximum by vertical Bunsen Flame Test.

(*c*) Fire-resistance standard of *the New Zealand Mines Dept.*:

"A piece 3″×3″ when heated for one minute over a Bunsen burner having a flame 2″ in height, the top of the burner being 2¼″ below the underside of the sample, shall not inflame and shall cease to smoulder beyond the already charred area, after the removal of the flame."

2.2. *Other requirements* :

(*a*) The fabrics are generally used in the natural state and the finish should maintain the natural colour of the fabric.

(*b*) A minimum effective addon to avoid both excessive increase in weight of the fabric and imparting a poor hand to the fabric. Should not discolour the fabric. Non-toxic and no physiological action of the treatment of skin.

(*c*) Should penetrate (and not coat) the fabric uniformly and adhere firmly to the fabric.

(*d*) The breaking strength of the treated fabric before ageing shall not be less than that of untreated cloth. The breaking strength of the treated cloth after exposure in the accelerated weathering, shall not be less than 90% of untreated one.

(*e*) The treated fabric shall be approximately as flexible as the untreated one and shall show no apparent decrease in flexibility after exposure in the accelerated weathering test.

(*f*) The treated fabric shall not crease or crack when subjected to temperature from minus 20° F to minus 35° F for 6 hrs. and tested at that temperature by folding sharply upon itself.

(*g*) Laundered twelve times, loss in fire-resistance should be negligible. The fabric should also be unaffected by dry-cleaning.

(*h*) The finish shall be water-resistant when tested by spray test. As regards water-permeability, the leakage of water through the treated fabric shall not exceed 10 cc. and the leakage of water through the treated duck after subjection to accelerated weathering test should not exceed 250 cc.

(*i*) No appreciable decrease in porosity or permeability of the fabric as measured by both air and vapour transmission.

(*j*) Should not promote the growth of micro-organisms and the treated fabric shall be mildew-resistant.

(*k*) Should not be hygroscopic and have no deteriorating effect on materials with which it may be in contact during use.

(*l*) The finish should have a reasonable permanency under all usage conditions, ageing and storage.

APPENDIX O-B

A NOTE ON FIRE-PROOFING JUTE

(British Jute Trade Research Association Patent)

1. Recent research has shown that jute fabrics can be satisfactorily fire-proofed by a process substantially different from those now being proposed for the other fibres. According to B.P. 785,610 (British Jute Trade Research Association) effective fire-proofing is obtained by treating the jute material with an aqueous dispersion containing antimony ortho-phosphate and a chlorine-containing vinyl thermoplastic resin together with a suspending agent for maintaining the antimony ortho-phosphate uniformly dispersed It is claimed that jute so treated is not only resistant to flaming but also to the after-glow which can be just as destructive as flaming. Also important is the fact that jute fabric so fire-proofed retains this characteristic after the fabric has been weathered outdoors for three months or more and after it has been immersed in sea water for a month or more.

2. A suitable treatment for securing this fire-proofed character consists of padding the jute fabric with the following aqueous dispersion:—

A chlorine-containing vinyl resin in the form of a 55% aqueous dispersion (the commercially available Geon 652 of British Geon Ltd. is suitable)	76%
Antimony ortho-phosphate ($SbPO_4$)	12%
A 2% aqueous solution of sodium carboxymethyl-cellulose of medium viscosity (the suspending agent)	4%
Water	8%

Pressure in the padding mangle is arranged so that the fabric picks up 150% of liquor. The padded fabric is then dried—it is not necessary to cure fabric at a high temperature if the above designated type of vinyl resin is employed.

3. If the chlorine-containing vinyl resin is polyvinyl chloride, then the following padding liquor will be found suitable:—

Polyvinyl chloride (a 55% aqueous dispersion)	66%
Tricresyl phosphate (a 55% aqueous emulsion) as a softener	17%
Antimony ortho-phosphate	10%
A 2 per cent aqueous dispersion of sodium carboxymethyl-cellulose	7%

In this case, it is desirable to cure the padded and dried fabric jute for a few minutes at 130 to 150° C.

4. It may be recalled that during the war considerable use was made of a fire-proofing treatment in which there was applied to the textile material an aqueous dispersion containing antimony oxide and chlorinated paraffin wax. The idea behind such a treatment was that on application of heat the wax compound decomposed with liberation of hydrochloric acid which then combined with the antimony oxide to give antimony oxychloride which is well known to have the power to retard flaming but not after-glowing. To prevent after-glowing it is generally satisfactory to have a phosphates also present as indicated in the new process described above. The insoluble resin constituent will be responsible for rendering the fireproof character fast to leaching during weathering or immersion of sea water.

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APPENDIX P

FIRE-FIGHTING EQUIPMENT UNDER MANUFACTURE IN INDIA—NAMES OF INDIGENOUS MANUFACTURERS

Sl. No.	Item of Manufacture	Names & Addresses of Indigenous Manufacturers	Type of Equipment manufactured	Remarks
(1)	(2)	(3)	(4)	(5)
1.	Chemical Fire Extinguishers ..	(1) M/s. Bengal Chemical & Pharmaceutical Works Ltd., Calcutta. (2) M/s. Kooverji Devshi & Co. Private Ltd., 164 Lohar Street, Bombay. (3) M/s. Minimax Ltd., Lalbazar Street, Calcutta. (4) New Associated Commercial Enterprises Private Ltd., 127/129 Modi Street, Bombay. (5) M/s. Oriental Metal Pressing Works Ltd., 131 Worli, Bombay. (6) M/s. Sur Enamel & Stamping Works Private Ltd., 24 Middle Road, Calcutta.	Soda acid, Foam, CTC, Dry-Chemical, Water & Co. 2, Frowave, Hand Chemical Extinguishers.	Sufficient indigenous manufacture to meet country's demand.
2.	Portable Units	(1) M/s. Bengal Chemical & Pharmaceutical Works Ltd., Calcutta.		

(1)	(2)	(3)	(4)	(5)
		(2) M/s. Minimax Ltd., Lalbazar Street, Calcutta. (3) M/s. New Associated Commercial Enterprises Private Ltd., 127/129 Modi Street, Bombay. (4) M/s. Oriental Metal Pressing Works Limited, 131 Worli, Bombay.	For use in Office Godowns & Cinemas 10/34 gallons per minute.	Sufficient indigenous manufacture to meet country's demand.
3.	Knap Sack Tanks	(1) M/s. New Associated Commercial Enterprises Private Ltd., 127/129 Modi Street, Bombay.		
4.	Stirrup Pumps	(1) M/s. Kooverji Devshi & Co. Private Ltd., 164 Lohar Street, Bombay. (2) M/s. Minimax Ltd., Lalbazar Street, Calcutta. (3) M/s. New Associated Commercial Enterprises Private Ltd., 127/129 Modi Street, Bombay.		
5.	Pumps for Mounting on vehicles (1) Front	(1) M/s. Delhi Garage Private Ltd., Con. Circus, New Delhi.	120/300 g.p.m.	
		(2) M/s. Addison & Co., Mount Road, Madras.	250 g.p.m.	
	(2) Rear	(3) M/s. Delhi Garage Private Ltd., Con. Circus, New Delhi.	120/300 & 350/350 g.p.m.	
		(4) M/s. Minimax Ltd., Lalbazar Street, Calcutta.	150/1000 g.p.m.	

6. Trailer Pumps	(1) M/s. Minimax Ltd., Lalbazar Street, Calcutta.	500 g.p.m.
	(2) M/s. Modi Brothers, Con. Circus, New Delhi.	
7. (1) Fire-fighting Vehicles & Fire Engines (Built round vehicles ‿ manufactured indigenously).	(1) M/s. Delhi Garage Private Ltd., Con. Circus, New Delhi.	
	(2) M/s. Kooverji Devshi & Co. Private Ltd., 164 Lohar Street, Bombay.	
	(3) M/s. Minimax Ltd., Lalbazar Street, Calcutta.	Includes Air field Crash tenders 1000/1500 g.p.m.
(2) Accessories:	(4) M/s. Delhi Garage Private Ltd., Con. Circus, New Delhi.	
	(5) M/s. Kooverji Devshi & Co. Private Ltd., 161 Lohar street Bombay.	Hydraulic valves, Branch pipes, D & C breaches Nozzles, Fire bells etc. Fire bells Stainers, Branch pipes D & C branches Diff. Nozzles, Delivery & hydraunt valves etc. Electrical Sirens.
	(6) M/s. Minimax Ltd. Lalbazaar Street, Calcutta.	
	(7) M/s. P. S. G. & Sons Ltd., Peelamedu, Coimbatore.	
	(8) M/s. Sur Enamel & Stamping Works Private Ltd., 24 Middle Road, Calcutta.	Branch Pipes, D & C breaches, stainers etc.
(*a*) Alax hoses	(1) M/s. Jyshree Textiles Ltd., P.O. Rishra, West Bengal.	Rubber Hoses of various sizes.
(*b*) Other hose pipes (of rubber canvas)	(2) M/s. National Rubber Manufacturing Limited, Bengal.	
9. Industrial Safety Equipment ..	(1) M/s. Josephs Lislie & Co., 105 Appolo Street, Bombay.	

(1)	(2)	(3)	(4)	(5)
10.	Sprinkler System. (*i*) Sprinkler heats (*ii*) Pumps (*iii*) Alarm gong (*iv*) Automatic Valves.			
11.	Firedoor Accessories (*i*) Fusable links (*ii*) Alarm gongs (*iii*) Automatic Valves			
12.	Escape & Rescue Equipments (*a*) Ladders	(1) M/s. Delhi Garage Private Ltd., Connaught Circus, New Delhi. (2) M/s. Famous Ladder Mfg. Co., Victoria Road, Bombay-27.		

APPENDIX Q

(Extract from Government of India Ministry of Commerce & Industry Import Trade Control Policy for the Licensing Period April..................September 1960)

ESTABLISHED IMPORTERS

16. *Definition.*—Established Importers are persons or firms who have been actually engaged in import trade of the articles comprised in any one serial number or sub-serial number as the case may be, of the I.T.C. Schedule during at least one financial year (1st April to 31st March) falling within the basic period as specified for the particular serial number or sub-serial number. The importers may choose the best year from the basic period for the purpose of obtaining *quota certificates certifying the value of their best year's imports.* A large majority of established importers have already in their possession quota certificates issued to them by the licensing authorities. In the recent past, these quota certificates have been issued on security paper, and during the previous licensing periods an attempt was made to replace the old quota certificates with fresh ones on security paper.

17. *Basic Period.*—The basic period out of which the established importers can select the best year for the purpose of calculating the quota in from 1st April 1951 to 31st March, 1952. In the case of Art Silk Yarn, the basic period will continue to be from 1st April 1945 to 31st March, 1951. The basic period has been extended to 1952-53, 1953-54, 1954-55, 1955-56, 1956-57, 1957-58 and 1958-59 in the case of a large number of items. The list of items for which the basic period has been extended will be found in Appendix IX. In respect of items which were covered by Open General Licences Nos. XLIV and XLV, dated 29th September, 1956 and which have now, been brought to quota licensing the basic period will be any financial year from 1952-53 to 1955-56 only provided that;

(*i*) in the case of any such items included in lists, E, F and G of Appendix IX the basic period will be from 1952-53 to 1957-58 and 1952-53 to 1958-59 respectively; and

(*ii*) in respect of composite Serial Nos./Sub.-Nos, consisting of a number of items where certain specific item(s) was/were included in the said OGLs the basic period will be from 1951-52 to 1955-56.

18. With effect from the current licensing period the basic period has been curtailed to exclude the period commencing from 1945-46 to 1950-51. No applications for fixation/re-establishment of quotas will now be accepted in respect of past imports in any financial year from 1945-46 to 1950-51. Quotas already fixed in respect of imports during the period from 1945-46 to 1950-51 will continue to be accepted for the grant of quota licences.

19. *Procedure of calculating value of licences.*—Quota licences are given to established importers as a percentage of the total value of imports in any one financial year, out of the specified basic period of the importer's choice, as evidenced :

(*a*) by valid quota certificates issued on security forms;

(*b*) by registration numbers issued by J.C.C.I., Calcutta, or the licensing authority concerned in connection with the Quota Registration Scheme.

No other evidence need be tendered along with the application.

20. In para 20 of Section I of the Red Book for January-June, 1955, it was notified that with effect from the July-December 1955 licensing period, the old Quota Certificates will not be accepted for grant of import licences. However, such of the importers who had not received Quota Certificates on security forms, were advised to do so immediately and this concession had been extended upto July-December, 1956. With effect from January, June, 1957, the quota certificates, if any, on non-security paper will no longer be accepted for calculation of quotas.

21. It may be noted that in no case, will an import licence be granted on the basis of the old quota certificates (*i.e.* quota certificates not issued on security form).

22. If instead of obtaining the import licence on the basis of the quota certificate, the applicant desires for some good reason, to have his quota established afresh or revised he should submit an application to the licensing authority mentioned in column 3 of the policy statement in Section II. Previously, the application for the establishment of quotas used to form part of the application for the grant of a licence. In the interest of simplicity and despatch, applications for the establishment or revision of quotas should henceforward be made separately.

23. *Establishment* or refixation of quotas.—Applications for establishment or refixation of quotas should be made in form 'F' given in Appendix VI, and should be accompanied by :

(1) the previous quota certificate, wherever it is sought to be revised;

(2) a certified copy of the import licence, if any, received for the previous half-year;

(3) a statement of basic year's imports in the forms prescribed in Appendix VI, supported by relevant documents mentioned in paragraph 25 of Chapter II of the Hand Book of Rules and Procedure, 1956;

(4) a statement giving reasons to prove the necessity for the establishment or refixation of the quota.

24. Applications for establishment/refixation of quotas will be entertained in respect of items for which the basic period has been extended to include the financial year 1952-53, 1953-54, 1954-55, 1955-56, 1956-57, 1957-58 and 1958-59 or in cases in which the licensing authority is satisfied that the applicant has been unable, for some good reason, to prove his basic imports and to establish his quota in the previous licensing periods. The need for establishing fresh quotas will, for instance, arise in cases in which the item in question has been allotted a separate serial number, or the system of quota licensing has been introduced for the first time, or the applicant was unable, for some good reason (*e.g.* litigation or financial difficulties), to apply for facilities to participate in the import trade. If the licensing authority is satisfied that it is necessary to establish a fresh quota or revised the quota certificate, the basic imports will be determined, and the quota calculated in accordance with the prescribed procedure. In the case of imports at the port of Calcutta, the Customs Authorities were not issuing an extra copy of the Bills of Entry and instead Customs duty receipts were being issued; in such cases either the exchange control copy of the Bills of Entry or the Customs duty receipts together with the Bank Drafts, and the relevant invoices duty attested by the Customs Appraiser, may be accepted *in lieu* of the triplicate copy of the Bill of Entry. Since 14th May, 1952, the Customs authorities at Calcutta had, in addition

to the Exchange Control Copy of the Bill of Entry, started issuing to the importers an extra copy of the Bill of Entry, namely, the quadruplicate copy. With effect from 15th February, 1954, however, the Calcutta Customs authorities have modified the procedure and have started issuing to the importer a triplicate copy of the Bill of Entry together with the Exchange Control Copy. With effect from the dates specified above, therefore, the quadruplicate/triplicate copies of the Bill of Entry alone (and not the Exchange Control Copies) duly supported by the relevant invoices will be accepted. No application for fixation of quota for items which are under O.G.L. or are banned, need be made.

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APPENDIX R

(Extract from Government of India, Ministry
of Commerce & Industry Import Trade
Control Policy for Licensing Period April
............September 1960).

ACTUAL USERS

35. *Definition.*—Actual users have been defined as those who require raw materials or accessories for use in an industrial manufacturing process. For the period July—December 1952, an additional condition, limiting the scope of actual users to undertakings employing not less than 50 workers had been prescribed. The condition caused inconvenience in some cases, and, consequently, it was not enforced strictly during the period January—June 1953. The same practice will be continued during the period April—September, 1960. When making an application for an import licence in accordance with the procedure laid down below, due regard should be paid to the provisions of the Industries (Development and Regulation), Act, 1951. The applicant should satisfy himself that the undertaking is, if so required by the Act, duly registered or licensed.

36. *Application forms.*—The forms of application for use by Industrial undertakings applying for the grant of an actual users import licence are given in Appendix VI. The form (C) given in Appendix IV, is to be used by industrial firms borne on the registers of the Industrial Advisers (Development Wing, Ministry of Commerce & Industry, New Delhi), when applying for the import of materials, or accessories required for use in the industry registered with the Development Wing. *The form (B) given in Appendix VI should be used by all other actual Users.* In cases where the essentiality certificate obtained by the applicant from the certifying authority is attached with the application or is submitted to the Licensing Authority separately, the Essentiality Certificate should bear the following endorsement duly signed by the applicant :

*"This essentiality certificate has been obtained by me from the
______________ and the contents of the certificate
(name of the certifying Authority)
have not been changed or altered.

Signature of the applicant."

SCHEDULED INDUSTRIES BORNE ON THE REGISTERS OF THE DEVELOPMENT WING

37. *Procedure for submission of applications for import licences or amendment of licences.*—Actual Users borne on the registers of the Industrial Advisers for a particular industry should in respect of the stores required for that industry apply to the Chief Controller of Imports through the Development Wing (Co-ordination). It is not necessary for such units to obtain any certificate from any other authority. These applications will be forwarded by the Development Wing with their recommendations to the Chief Controller of Imports, New Delhi, for necessary action.

38. Actual Users borne on the list of the Development Wing should observe the following procedure in submitting their application :—

(*i*) In addition to the information furnished against column B(i) of form 'C', the applicants should in their covering letter indicate precisely :—

(*a*) the name of the particular industry for which the stores are to be imported; and

(*b*) the total c.i.f. value in rupees.

(*ii*) Envelopes should be superscribed "Import applications" and addressed to Assistant Director (Co-ordination-II), Development Wing, Ministry of Commerce and Industry, New Delhi.

(*iii*) The applicants should ensure that the applications are posted in time to reach the Development Wing by the due date; applications sent by post and received in Development Wing after the due date are likely to be summarilly rejected.

(*iv*) It should be noted that the bulk applications for raw materials should not include spare parts of machinery. Separate applications should be made for import of spare parts of machinery.

39. Requests for increase in the quantity or value of the licence or for any addition in the items licensed should also be routed through the Industrial Adviser concerned.

40. *I.T.C. Classification of raw materials.*—The Actual Users Borne on the registers of the Industrial Advisers (Development Wing) are required to show the I.T.C. classification of the individual items in their applications. It is noticed that this requirement has not been complied with in a number of cases. It is therefore again impressed on the intending applicants that they should invariably show the I.T.C. classification of the individual items in their applications failing which the Development Wing will refuse to entertain such applications. The applicants should also enclose 10 copies of the list showing the details of items sought to be imported together with their value, quantity and I.T.C. classification with the application.

41. *Delay in submission of applications.*—It has come to notice that Actual Users borne on the registers of the Industrial Advisers submit their application for import licences to the Industrial Advisers just before the last date prescribed for the submission of applications. This is done presumably on the understanding that the more the stock of raw materials is depleted the larger will be the quantity to which the applicant will be entitled. This is not however correct on the other hand, the above practice results, in the rush of applications at the last stage and hampers the progress of disposal. It is hereby clarified that the Industrial Advisers will take into consideration only the stock expected to be held with the applicant in the middle of the licencing period irrespective of the date of application. Actual Users are, therefore, advised that they should not delay the submission of their applications and all applications should preferably be made in the beginning of the licensing period, giving the stock of the raw materials held at the time of application.

SCHEDULED INDUSTRIES NOT BORNE ON THE REGISTERS OF THE DEVELOPMENT WING AND NON-SCHEDULED INDUSTRIES——OTHER THAN SMALL SCALE INDUSTRIES

42. *Certifying Authorities.*—Actual Users who are (*i*) not borne on the registers of the Industrial Advisers (Development Wing) or (*ii*) borne on the

registers of the Industrial Advisers (Development Wing) but not for the particular industry in respect of which the application is proposed to be made, should submit their applications to the licensing authority shown against the item concerned in column 3 of the Policy statement given in Section II. The application should be accompanied by an essentiality certificate in the form given in Appendix VI from the certifying officer concerned. The officers who are authorised to issue the certificates of the essential requirements of actual users are :—

(*a*) the Director of Industries of the State where the, factory is located for industries other than those detailed below;

(*b*) the Textile Commissioner, Bombay, in the case of Textile Industry, other than jute, hemp and silk;

(*c*) the Chairman, Tea Board, Calcutta, for Tea garden requirements;

(*d*) the Chairman, Indian Coffee Board, for requirements in respect of the coffee industry;

(*e*) the Director, (Sugar Technical) Directorate of Sugar and Vanaspati, Ministry of Food, New Delhi, for requirements in respect of sugar industry;

(*f*) chairman, Indian Rubber Board, Kotayam, for requirements in respect of rubber estates;

(*g*) the Department of Mines and Fuel, Ministry of Steel, Mines and Fuel, New Delhi, for requirements of the Petroleum Industry;

(*h*) the Iron and Steel Controller, Calcutta, in the case of requirements of producers of iron and steel and rerolling mills;

(*i*) *the Coal Controller, Calcutta, for requirements of collieries;*

(*j*) the Central Water and Power Commission (Power Wing), Government of India, Bikaner House, Shahjahan Road, New Delhi. in the case of requirements of electricity undertakings;

(*k*) the Central Silk Board in respect of the requirements of the Silk Industry;

(*l*) the All India Handloom Board for requirements of the handloom factories;

(*m*) the Chief Director, Directorate of Sugar and Vanaspati, Ministry of Food, New Delhi, for requirements of Vanaspati industry;

(*n*) the Chairman, Coir Board, Ernakulam, for the requirements of coir industry;

(*o*) the Director General of Shipping, Bombay, for the requirements of Shipping Industry/Shipping Companies (in respect of sea going vessels);

The requirements in respect of inland steam and motor vessels will be certified by the Principal Officer, Mercantile Marine Department of the area concerned.

(*p*) the Directorate of Marketing and Inspection, Ministry of Food and Agriculture, Department of Agriculture, New Delhi, for requirements of fruit and vegetable preservation industry;

(*q*) Jute Commissioner, Calcutta, for the requirements of Jute Industry; and

(*r*) *the Director, Indian Bureau of Mines, Nagpur, for the requirements of mines (other than collieries).*

43. *Basis and scope of Licensing.*—(*a*) The licences for raw materials will, ordinarily be issued on the basis of certified requirements for six months' consumption; but the certified requirements will be scrutinised by the licensing authority and an appropriate reduction will, where necessary, be made after taking into account :—

(*i*) the stock held on the date of application and the expected arrivals against licences in hand;

(*ii*) the quantum of import likely to be available through the commercial channels;

(*iii*) the quantum of similar goods or substitutes likely to be available from indigenous sources; and

(*iv*) the past imports of the item in question by the Actual Users.

(*b*) Normally the applications from Actual Users who are applying for the first time would be rejected. In the case of Actual Users who have been making imports of the items in question against Actual Users licences granted to them against earlier periods licences in excess of their average past imports will not normally be granted. However, in hard cases where the Actual User is unable to obtain his requirements from the open market the port licensing authority may in his discretion issue a licence to meet the Actual Users requirements subject to the availability of the foreign exchange and on the special recommendation of the certifying authorities.

(*c*) The items licensable to Actual Users have been indicated in the appropriate column of the Policy statement in Section II of this Book. A consolidated list of these items has been given in Appendix IV. Applications from Actual Users for items which are not shown as licensable to Actual Users in Section II of the Red Book will not ordinarily be entertained. Requirements for such items should be met either by using indigenous substitutes, or by purchases from internal stocks against import through established channels.

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